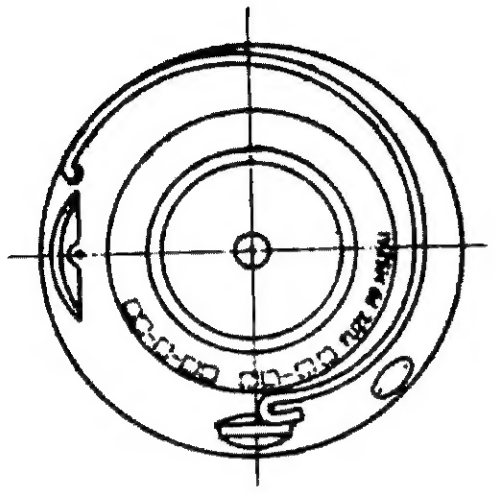
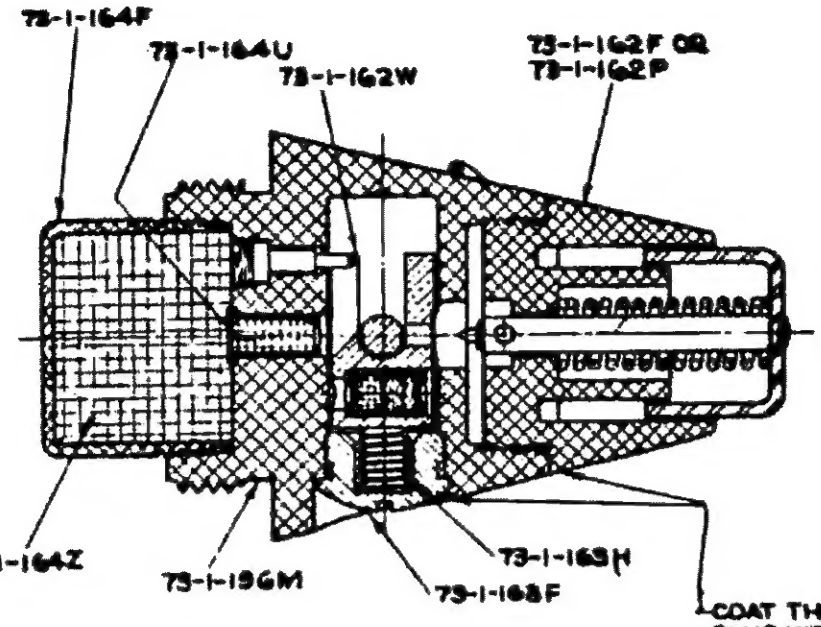
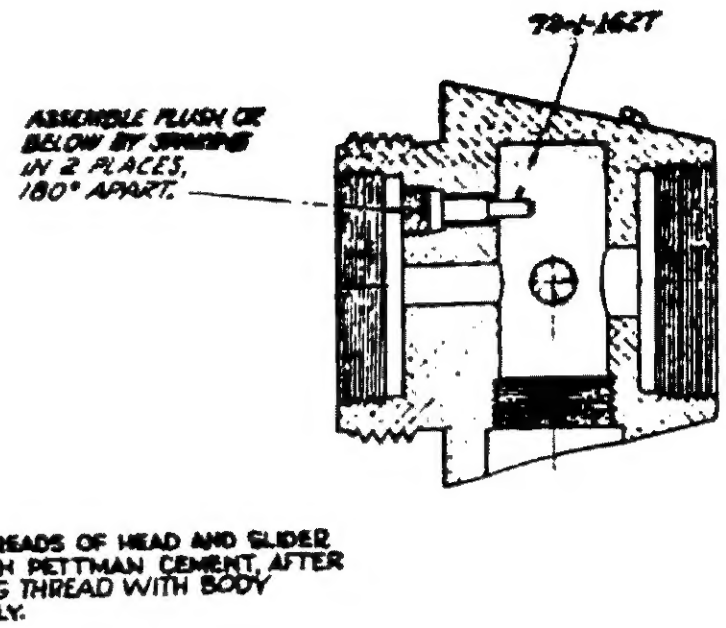
Note: Refer to general info on M52 Fuze, Volume Two, Issue #1, pg.24. The info is reprinted from Army FM-23-85. To avoid confusion, use only the lower illustration when determining the relationship of the various Fuze components. The Army draftsman apparently flipped over the negative on the top illustration, resulting in an inside out drawing. (The Safety Pin, Spring and Setback Pin are on the wrong side.) Note also that the Safety Wire on the lower drawing is installed from the wrong side. (It's a wonder we won the war!)

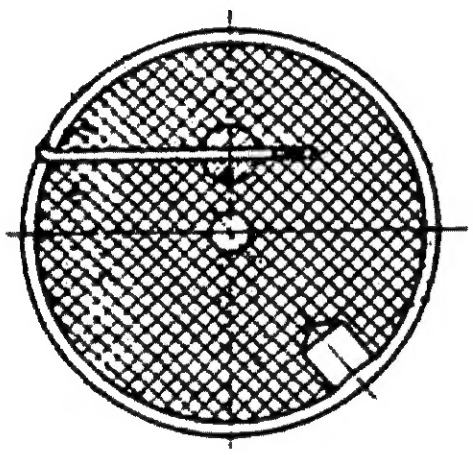
FUZE, POINT DETONATING, M52A1 ASSEMBLY AND DETAILS

73	1	161

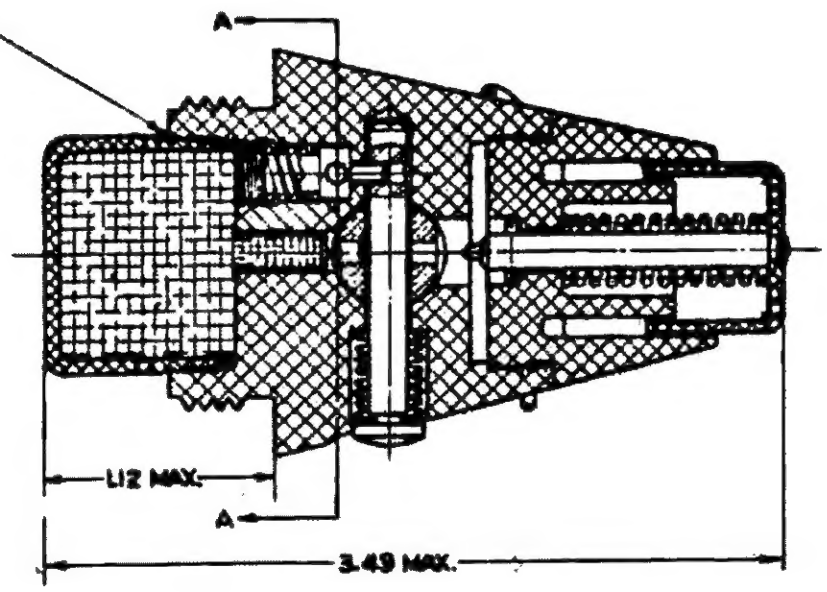


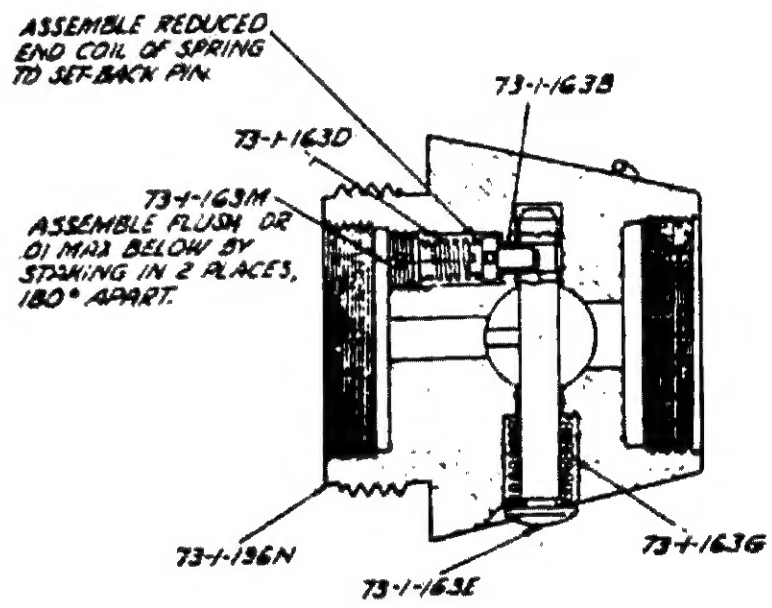






SECTION A-A
PART OF SLIDER CAVITY AND LOCKING PIN OMITTED.





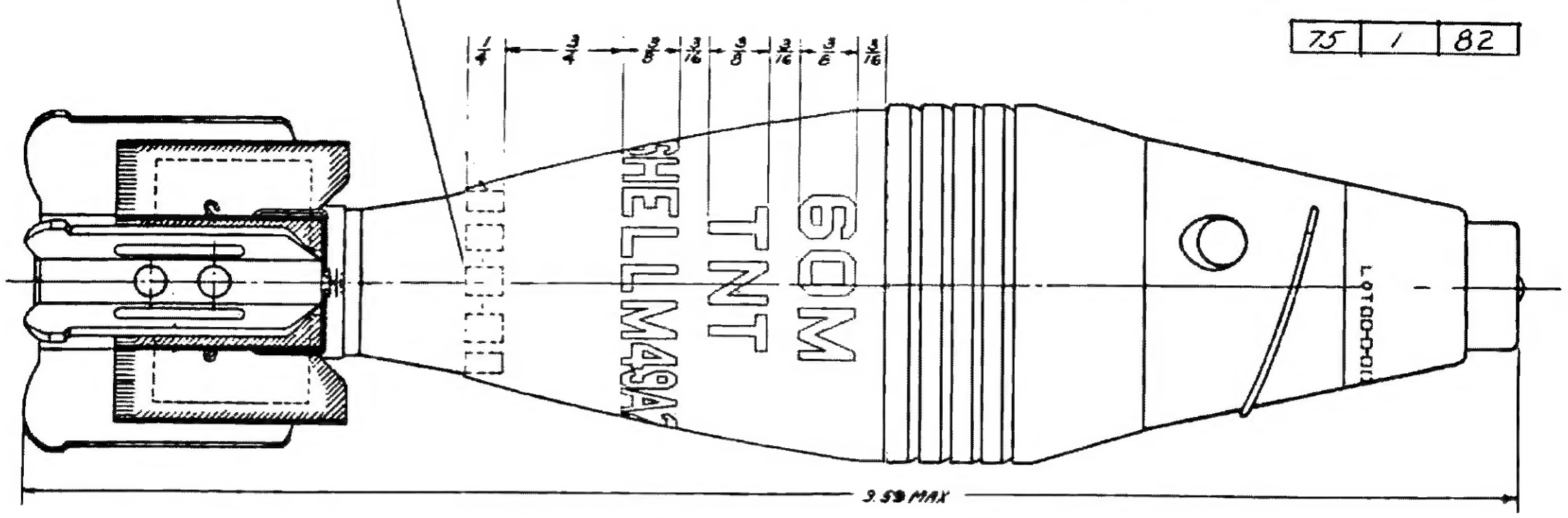
ASSEMBLY T3-1-161A10

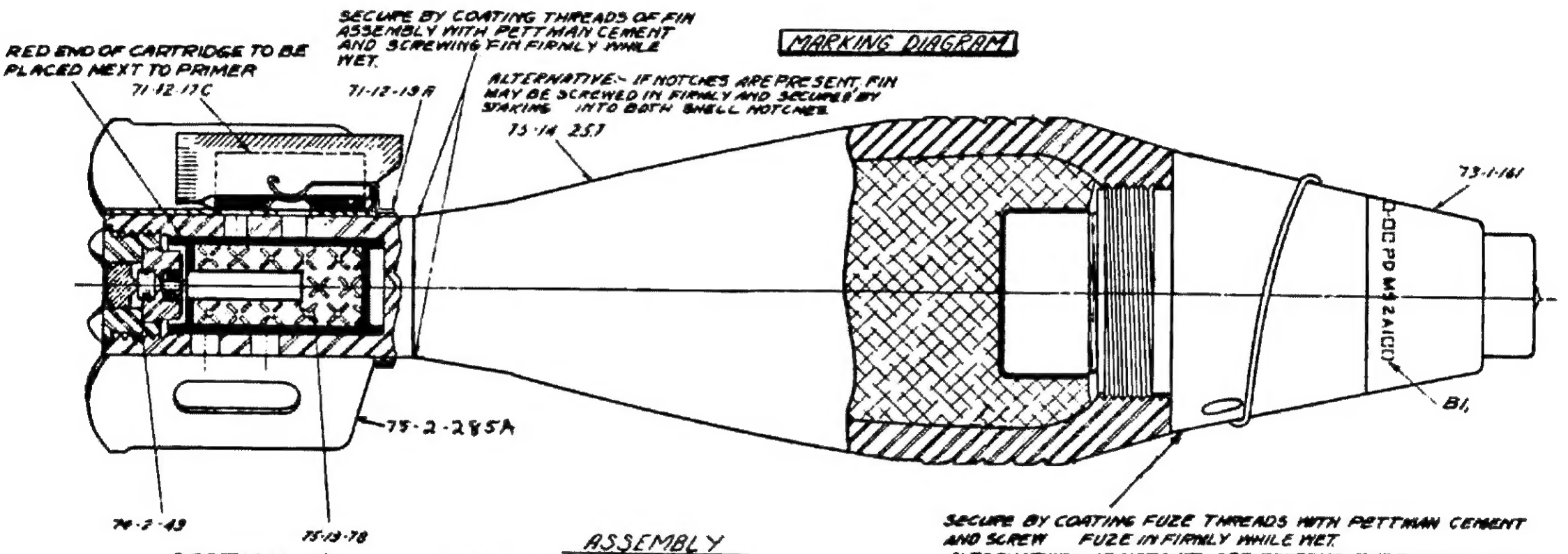
1. Prior to Fuze assembly, press the Tetryl Booster Lead into position through the bottom of the Fuze Body.
2. Press the Primer/Detonator, green side up, into the hole in the top of the Slider Assembly.
3. Insert Safety Pin and Spring into Fuze Body. Hold them in position until the Setback Pin, Spring, and Plug can be installed, locking the Safety Pin in place. The Setback Pin should be inserted with its hole aligned with the Safety Wire Hole. Install the Safety Wire at this time.
4. Install the Slider Guide Pin through the bottom of the Fuze Body. Note that this version, (pg.63) is a GUIDE PIN ONLY. The Slider is held in proper firing position by the Slider Spring ONLY.
5. Insert Slider, aligning the slot on the bottom with the Slider Guide Pin. Install Slider Spring and Slider Plug.
6. Apply permatex to the threads on both the Striker Head and the Booster Cup. Screw both assemblies tightly into place on the Fuze Body.
7. Remove Closing Plug from loaded Shell Body.
8. Apply permatex to the external Fuze Body threads and screw Fuze Assembly tightly into place w/Fuze Wrench. Staking Fuze in place is optional.

SHELL, HE, M49A2, W/FUZE PD M52A1 FOR 60-MM MORTARS ASSEMBLY AND MARKING DIAGRAM

75	1	82

PAINT OVER SHELL LOT NUMBER WITH OLIVE DRAB LACQUER ENAMEL OR ENAM. THEN MARK AMMUNITION LOT NUMBER (INCLUDING INITIALS OR SYMBOL OF LOADER) WITH YELLOW STENCIL INK.
SAMPLE MARKING:- "ARMY LOT DD-3-DD"





SECTION AA

ASSEMBLY

TO BE ACCEPTABLE THIS ASSEMBLY MUST FREELY ENTER ALIGNMENT GAGE.

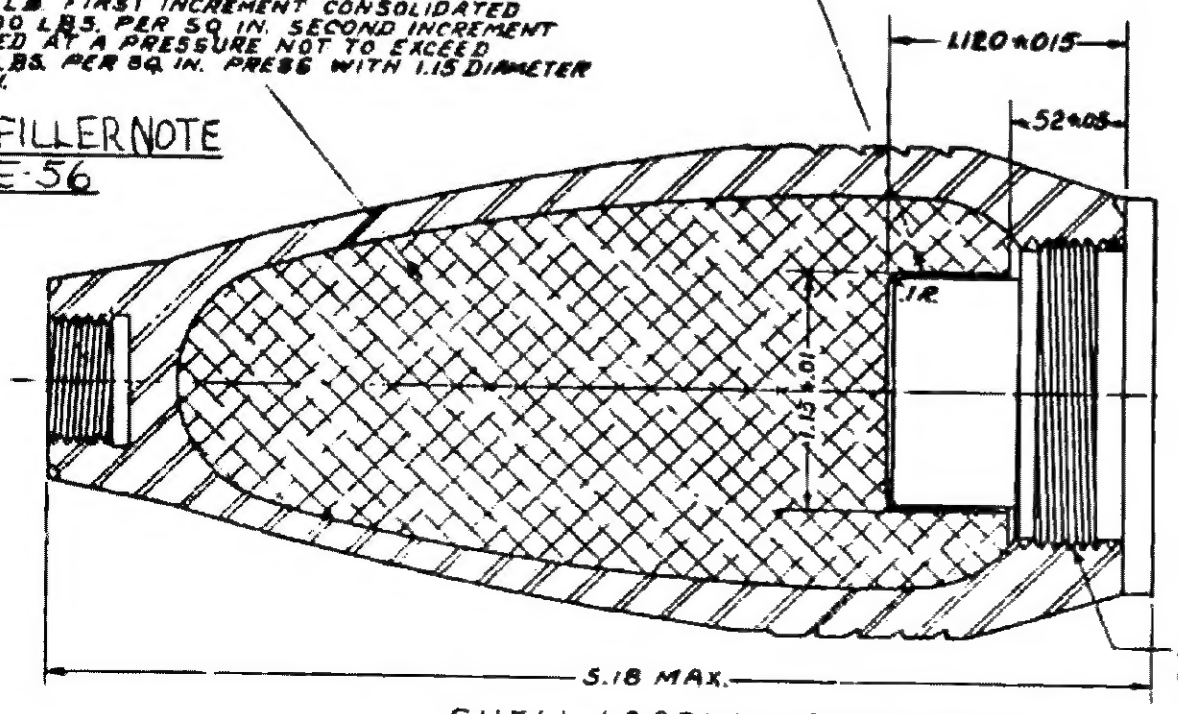
(a.) ALTERNATIVE - FUZE POINT DETONATING, M82A1B1 (WT - .43 LBS) DRG 73-1-199
(c) WHEN M82A1B1 FUZE IS USED, WT - 2.30 LBS
(e) FOUR REQUIRED, WEIGHT IS THAT OF FOUR.
(f) ALTERNATIVE - ENAMEL, GRADE I, SPEC JAN-E-7A
(g) WEIGHT SHOWN IS WITHOUT SAFETY WIRE, SAFETY PIN AND PROPELLENT CHARGE.
(h) SUBSTITUTE STANDARD PACKING.

APPROX WEIGHTS	POUNDS
SHELL, EMPTY	1.67 ± .06
CHARGE, BURSTING (TNT)	.34
TOTAL WEIGHT, UNFUZED	2.01
PLUG, CLOSING	.20
SHIPPING WEIGHT	2.21

CHARGE, BURSTING

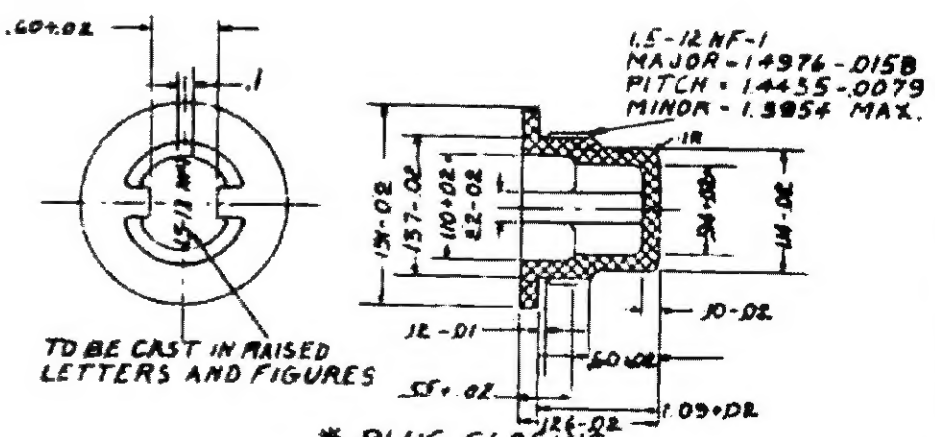
APPROX. 3/4 LB. FLAKE TNT, GRADE I
PRESSED INTO TWO EQUAL INCREMENTS OF .17 LB. FIRST INCREMENT CONSOLIDATED AT 2000 LBS. PER SQ IN. SECOND INCREMENT PRESSED AT A PRESSURE NOT TO EXCEED 3000 LBS. PER SQ IN. PRESS WITH 1.15 DIAMETER PUNCH.

SEE FILLER NOTE PAGE-56



SHELL LOADING ASSEMBLY

MEAN VOLUME OF CHARGE = 7.14 CU. IN.



* PLUG CLOSING
DIE CASTING, ZINC-ALUMINUM-MAGNESIUM

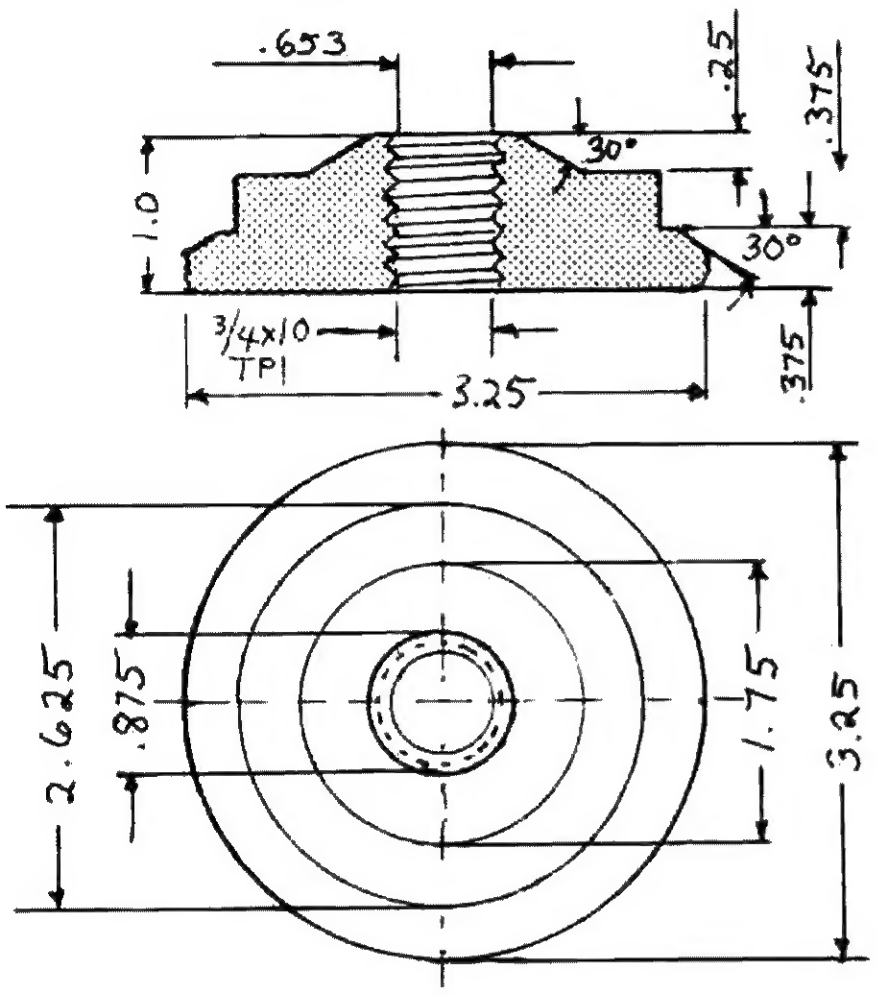
* REMOVE CLOSING PLUG BEFORE INSTALLING FUZE ASSEM.

60mm Mortar
part 3 BY CLYDE BARROW

Barrel Assembly

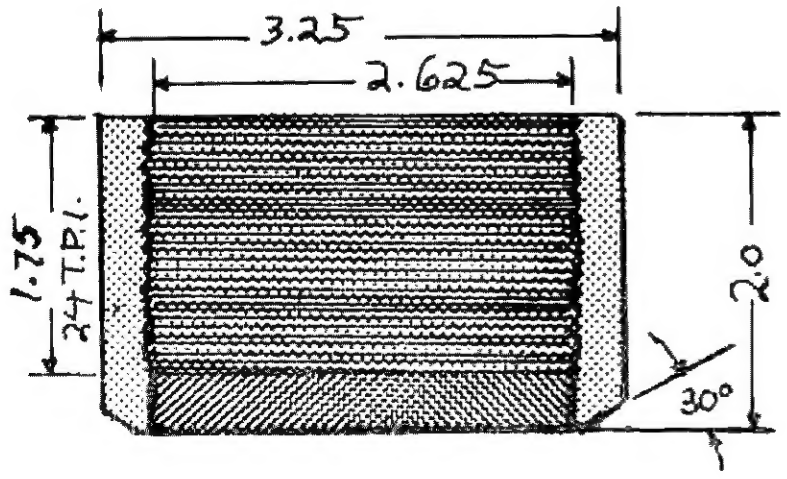
Piece A - Base Cap - Bottom Section
- 3.25"OD x 1" steel plate

Machine to dimensions shown. Drill a .653" diameter center hole and tap for a 3/4x10 TPI bolt. Grind or machine the two 30° bevels as shown. Top bevel is for fin clearance.



Piece B - Base Cap - Sleeve Section
- 3.25"OD x 2.625"ID seamless steel tubing.

Cut to length, square and deburr ends. Cut 24 TPI in the first 1.75" of the inside. Grind or machine the 30° bevel on the bottom edge as shown.

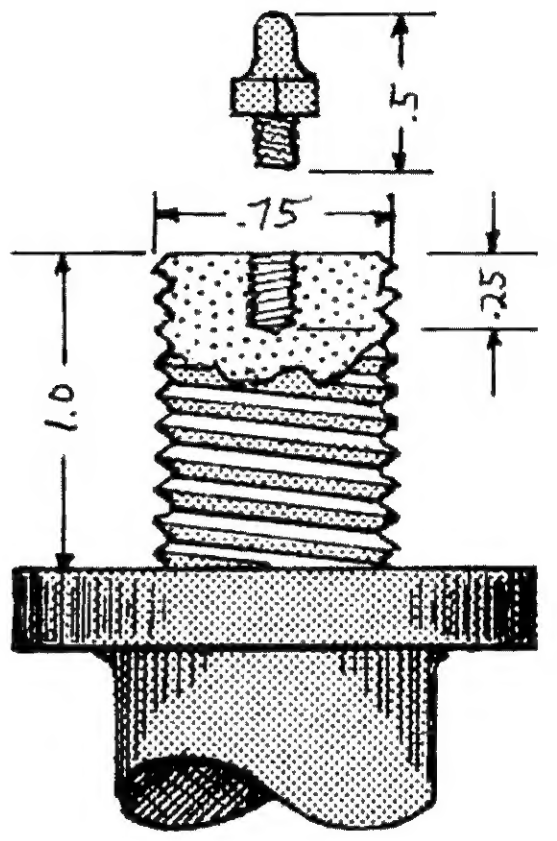


A-B - Assembly

Hammer or press bottom piece into sleeve section. Arcweld 360° around the 60° groove. Grind the weld flush w/sleeve surface. Heat treat or case harden completed base cap if possible.

Piece C - Trailer Hitch Ball
- 1.875" dia Ball w/.75" x 10 TPI threaded shaft.

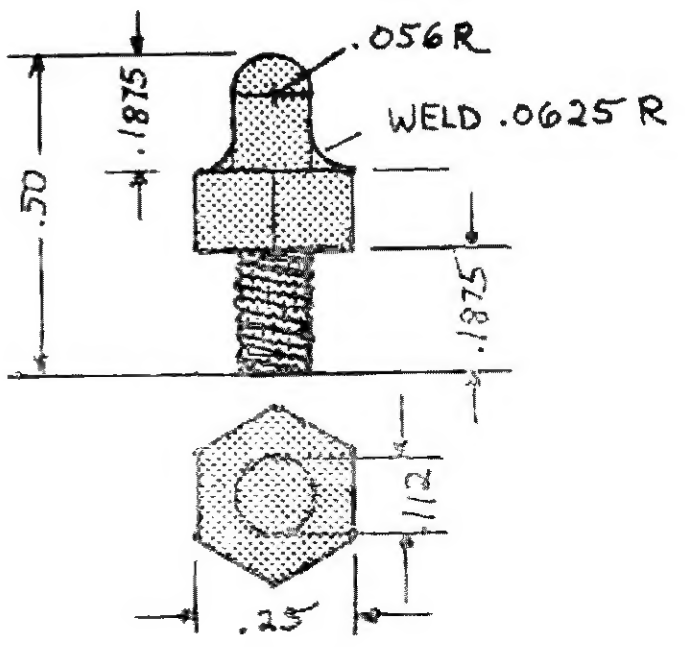
Cut shaft to 1.0" long. Drill .089"dia. hole, .25" deep, in center of shaft end. Tap the hole for a 4-40 screw. If shaft is hardened, spot anneal end before drilling and tapping.

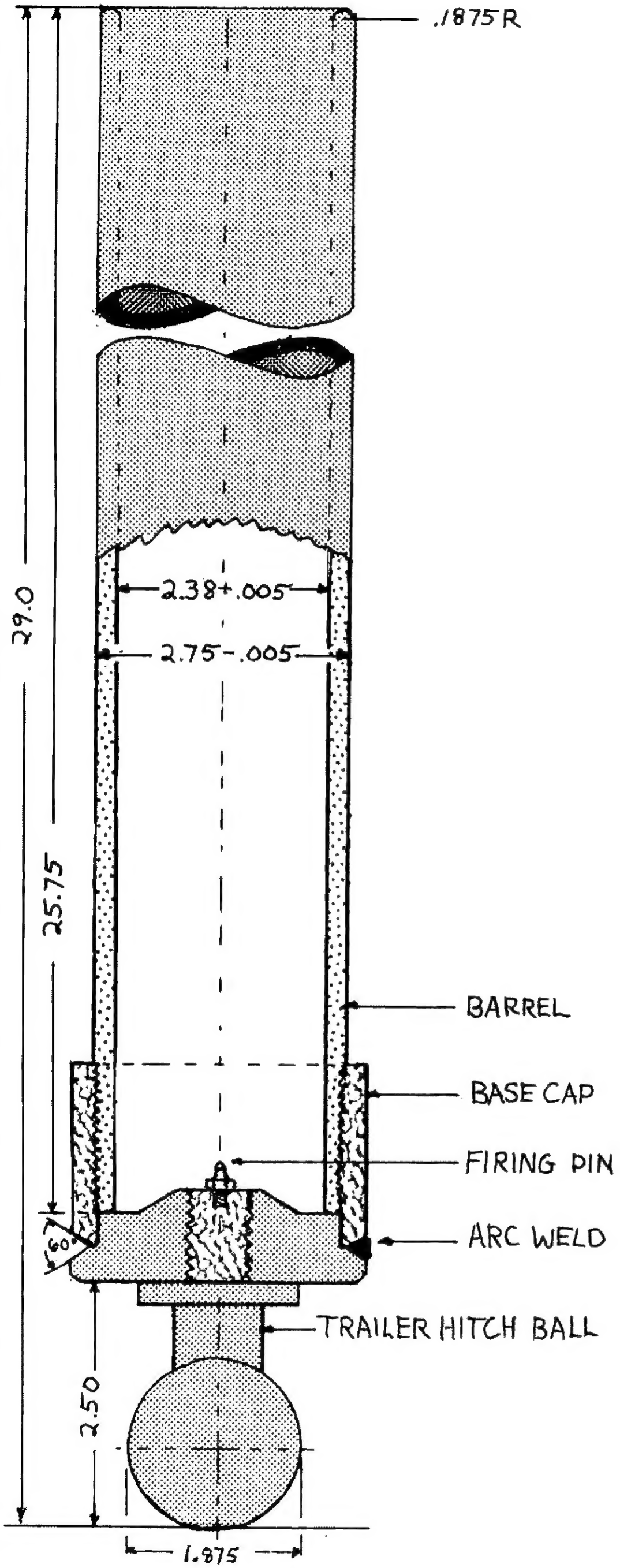


Piece D - Firing Pin

Weld a nut in place on a .5" section of 4-40 machine screw and finish piece as shown. Harden pin by heating until red and quenching in oil (not water). Polish until shiny, reheat until blue and requench in oil. Install firing pin in shaft end of Piece C. Note: Firing pins break, so make several extras. Remove broken pins by unscrewing Ball Assembly from the rear of the Basecap.

Note: Basecap should never be removed from Barrel.

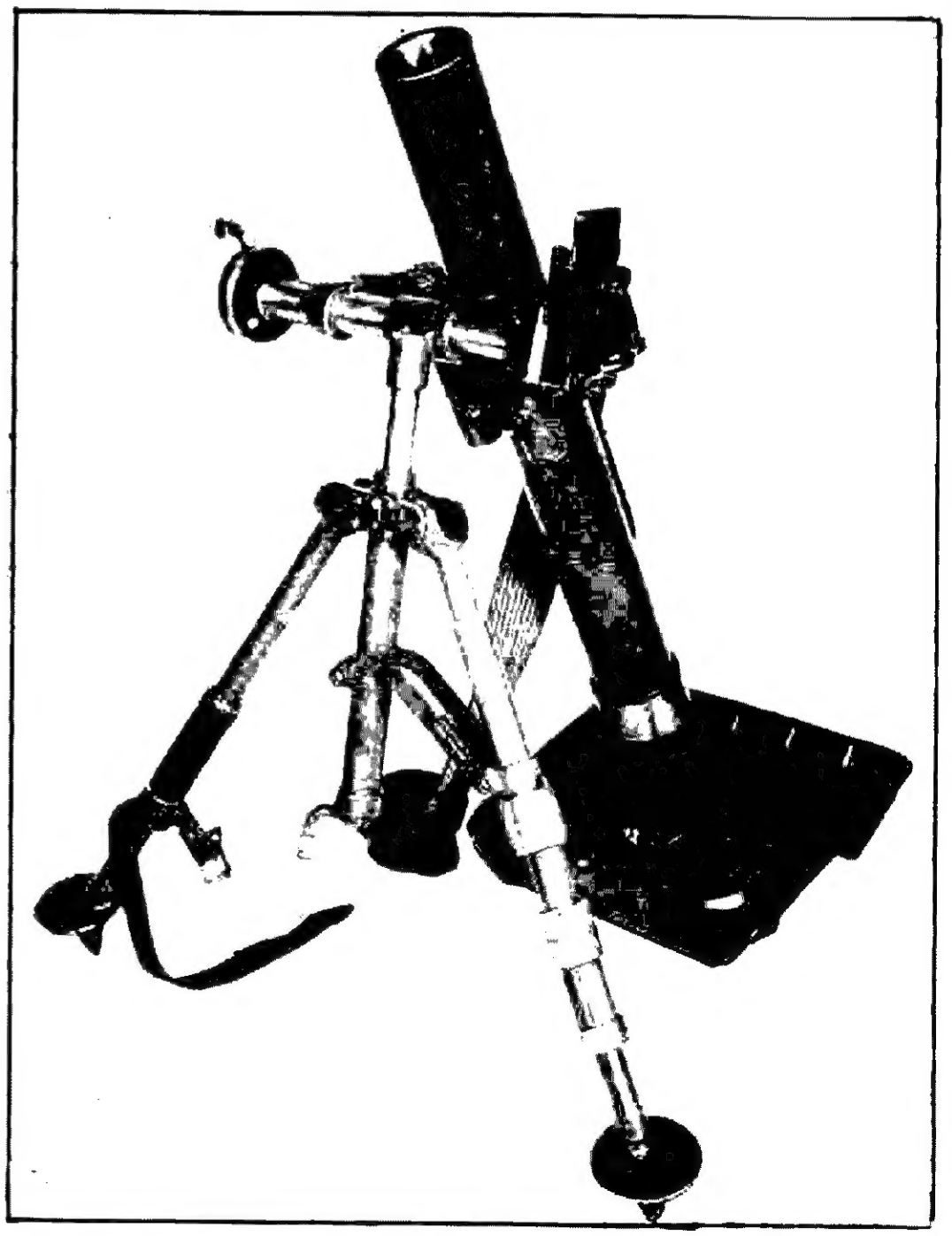




Piece E - Barrel - 2.75"OD x 2.375"ID x 25.75" long.

Material is cold drawn seamless mechanical tubing or similar high quality seamless steel tube. Use an inside micrometer and an auto engine cylinder hone to enlarge and polish the bore to 2.38" + .005". This is CRITICAL and is the most important operation of the entire project. Inside mikes and cylinder hones are available from local equipment rental shops. Cut the tube to length, square and deburr ends and crown the muzzle (.1875" half round). Thread 1.75" of the base end of the barrel w/24 TPI outside threads. Heat treat or case harden the finished barrel if possible. This will increase strength and reduce wear. Screw the barrel into the basecap (assembly A-B). Paint the outside of the completed assembly w/ olive drab enamel.

— Note: Do Not Paint the Inside of Barrel!



Barrel Cover - Carrying Strap

This assembly consists of a leather cap that resembles the dice cups used in bars, a canvas and leather strap and a steel clip. New GI Surplus cover assemblies are available from:
S & R Co., RD 2, Box 71, Arkport, New York, 14807. Price is $1.00 plus shipping.

60mm Mortar /part 4

Baseplate, Bipod & Collar/Buffer Assembly

BY CLYDE BARROW

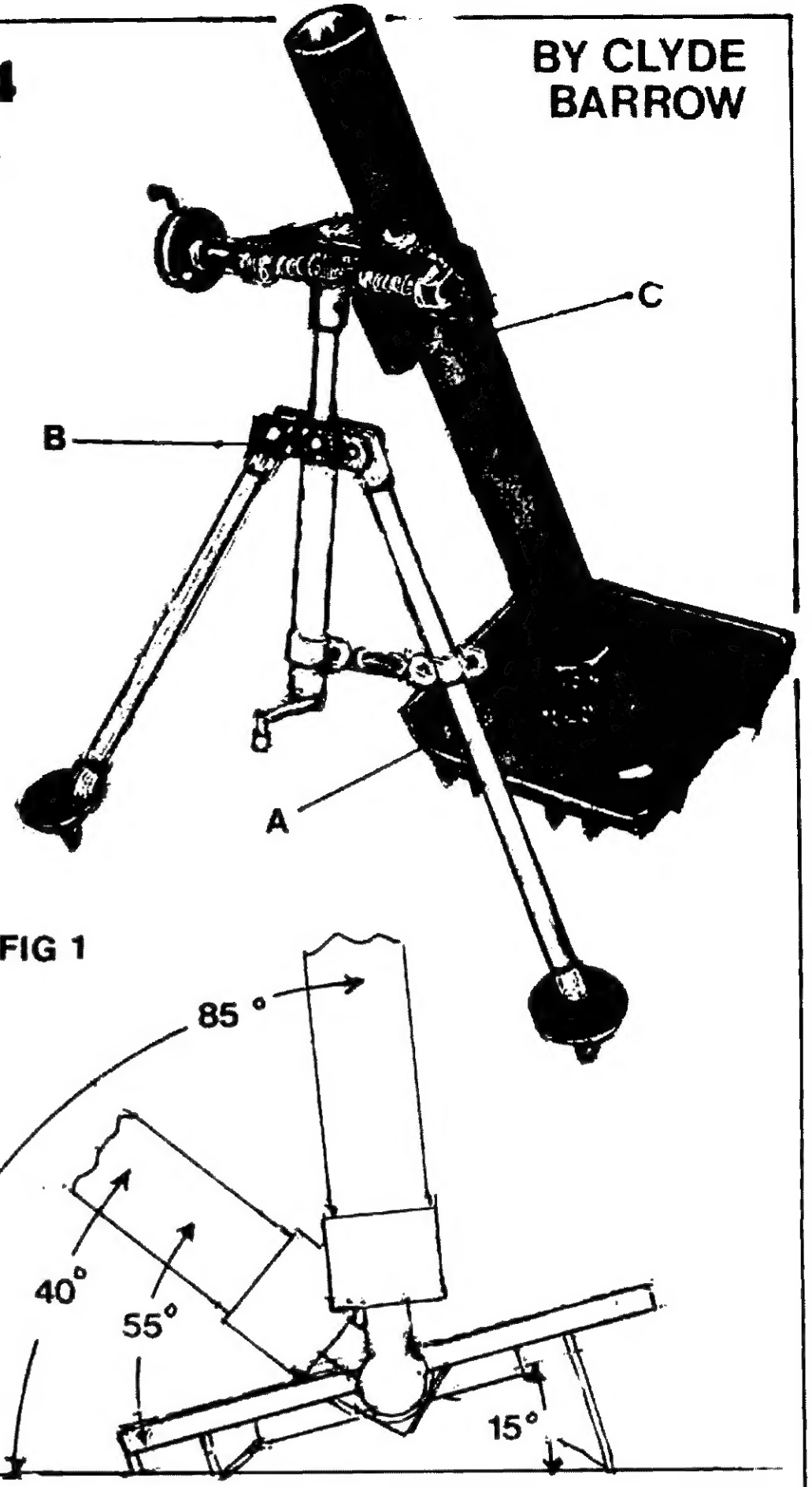


FIG 1

INTRODUCTION

Unlike the GI specs for shell and barrel production featured in Issue #2, the following part designs and dimensions are derived from several sources and are simplified for ease of construction. You should consider these designs as general outlines only. Each builder will undoubtedly find different materials and specs more suitable for one or more pieces.

The fifth and final section of this series, with all remaining building info will appear in Issue #4.

SECTION ONE - General Parts Descriptions

A. Baseplate

The baseplate is a sheet metal platform, 12" wide and 10" long. The front edge rests on the ground,while the rear is elevated approximately 15°.The plate intersects the barrel at 55°to 90°, depending upon barrel elevation.(see fig. one)

The upper surface of the baseplate's center is a recessed socket with a latching collar to accept and retain the round base of the barrel, which is free to pivot in all directions. When in use, the barrel may be adjusted vertically from 40° to 85°.Transverse or horizontal movement is 5" total, or 2.5" left or right of center, as measured at the transverse mechanism. The underside of the baseplate is fitted with four triangular feet that dig firmly into the ground to stabilize the mortar under fire.The front edge carries an additional row of four smaller feet that aid in stability.The four main feet,as well as the central socket area, are tied together and reinforced with several gussets and braces.

B. Bipod

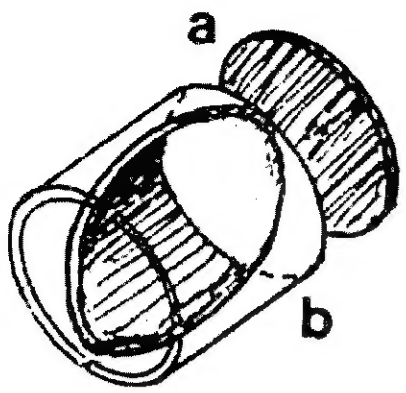
The bipod consists of two folding tubular steel legs,hinged at the top and fitted with spiked feet at the bottom. The feet are provided with wide discs to prevent them from sinking into soft or muddy ground.The leg hinges are attached to the ends of a clevis joint to allow adjustment for initial leveling of the sight assembly when firing on uneven ground. Adjustment is made via a turnbuckle assembly which links the elevation tube to the left bipod leg.Crank operated screw mechanisms are provided for both vertical and transverse fine adjustment.

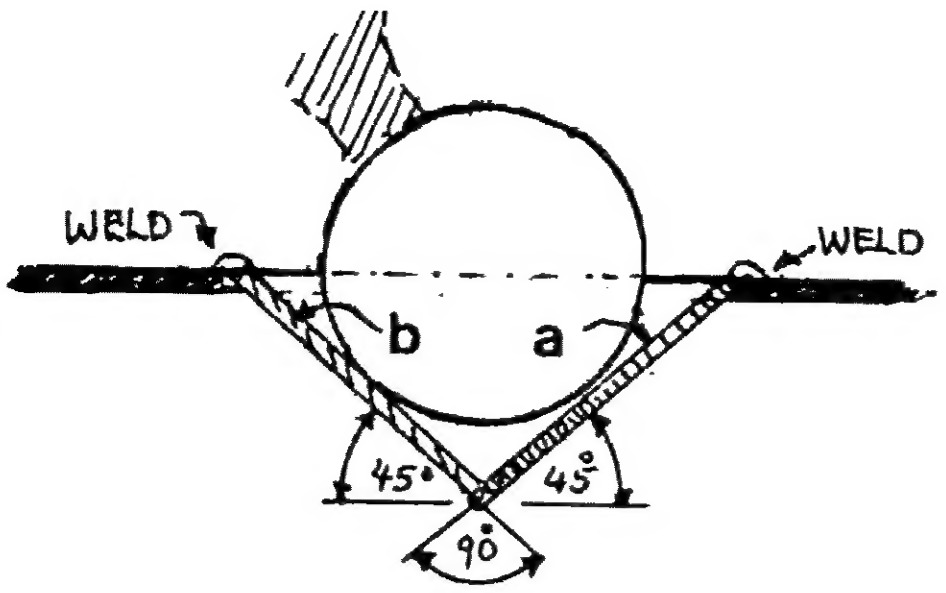
C. Clamping Collar-Buffer Assembly

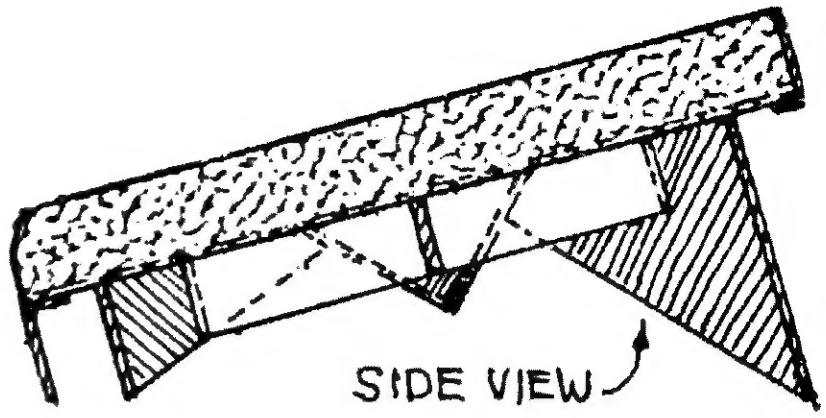
This mechanism serves to join the bipod to the barrel. The assembly consists of an upper hinged barrel collar and a lower saddle section which houses the two buffer or shock absorber mechanisms.

The upper ends of the buffers attach to recesses in top section (yoke) of the bipod.The buffers prevent barrel recoil from misaligning or damaging the bipod assembly. This feature may be omitted if desired, as several examples of WWII mortars were produced with a rigid bipod/barrel connection.

BASEPLATE

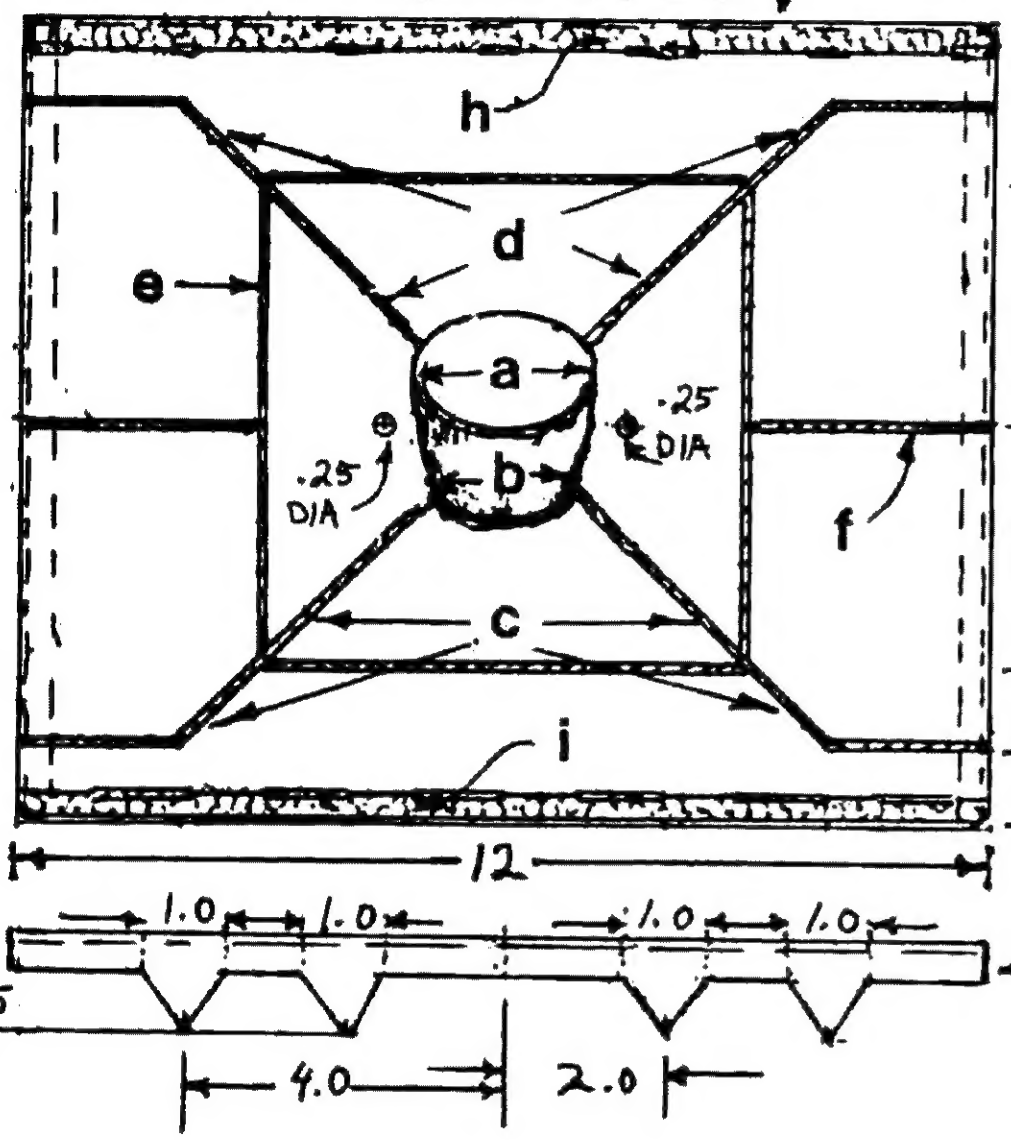




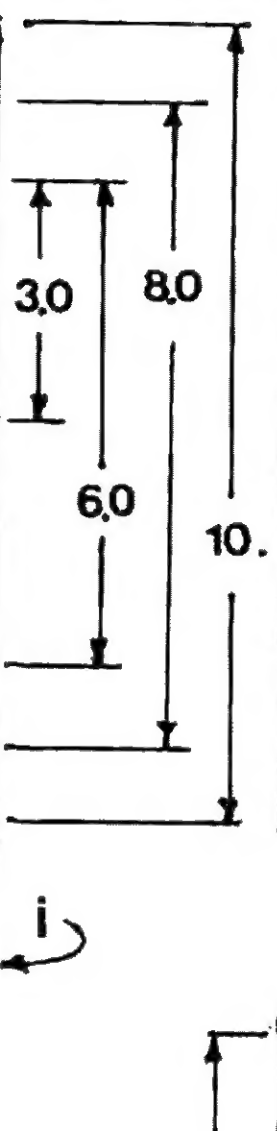


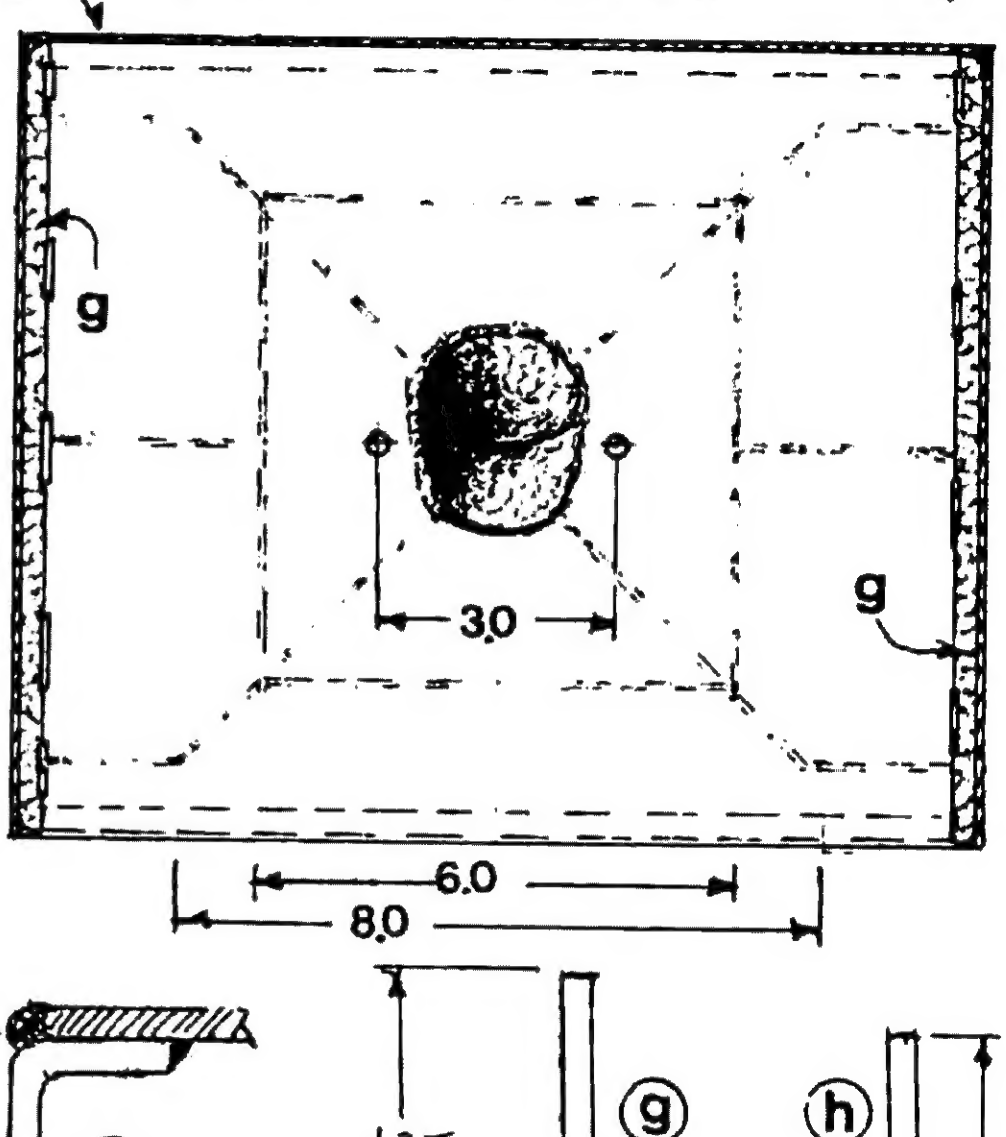
SIDE VIEW

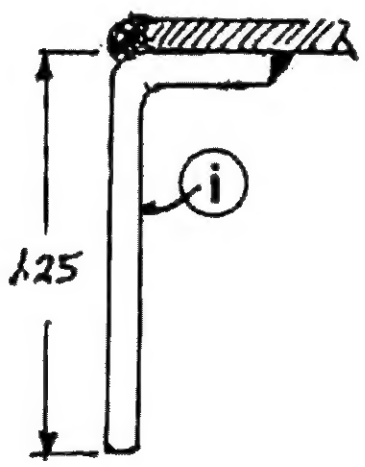
BOTTOM VIEW

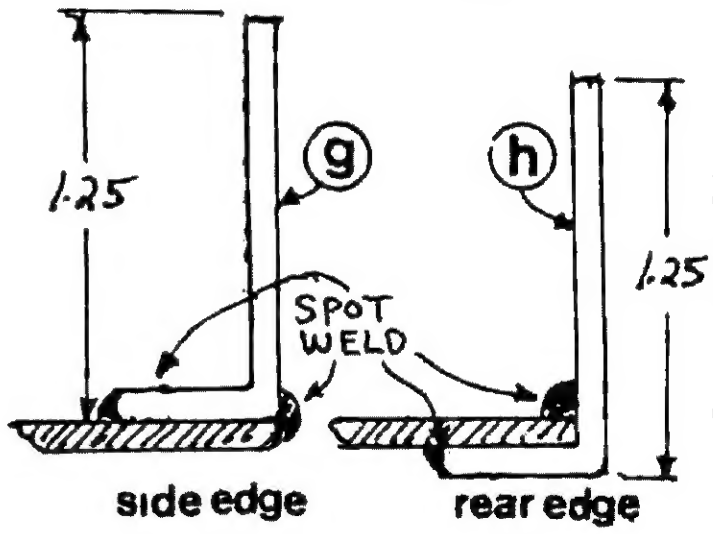


TOP VIEW









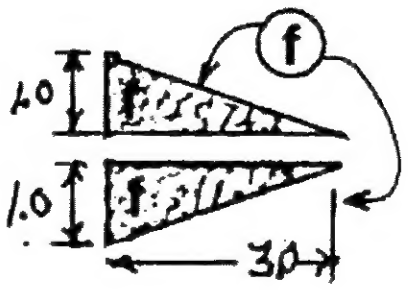
Baseplate Body-10 or 12 gauge steel, 10 x 12 inches.

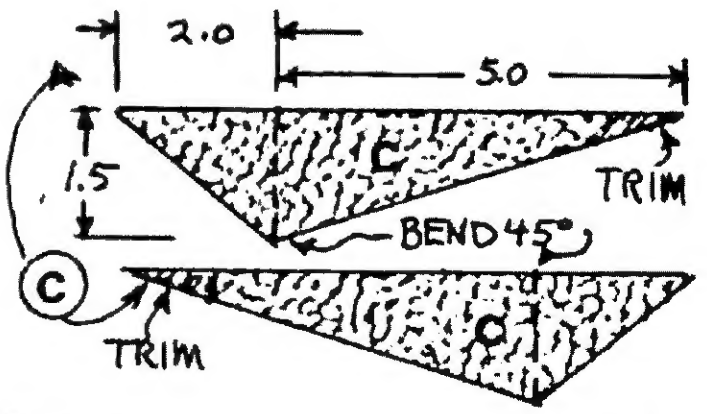
a. 2.25 dia x .125 thick steel disc.

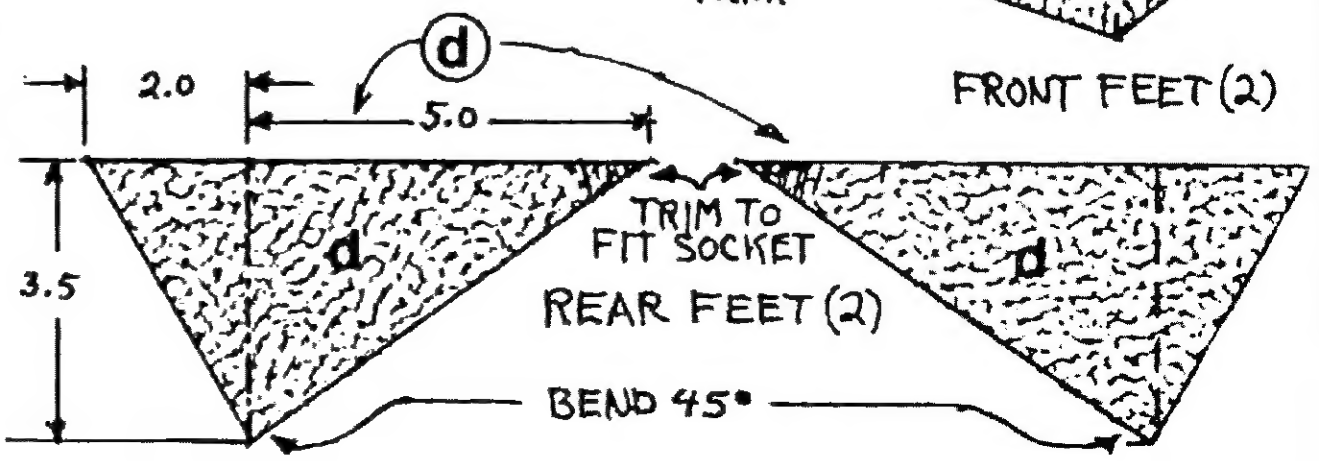
b. 2.25 OD / 2.00 ID x 2.25 long steel tubing. Cut on 45° angle after welding disc "a" in place. Weld completed assembly a-b into baseplate, disc to the rear.

c. Front Feet (two) - Cut from 1.5x7.0x .125 steel sheet. Bend 45° as shown and weld to baseplate and assembly a-b.

d. Rear Feet (two) - Cut from 3.5x7.0x .125 steel sheet. Same procedure as "c".







Cont. on pp 116

Baseplate-Cont. from pp 115

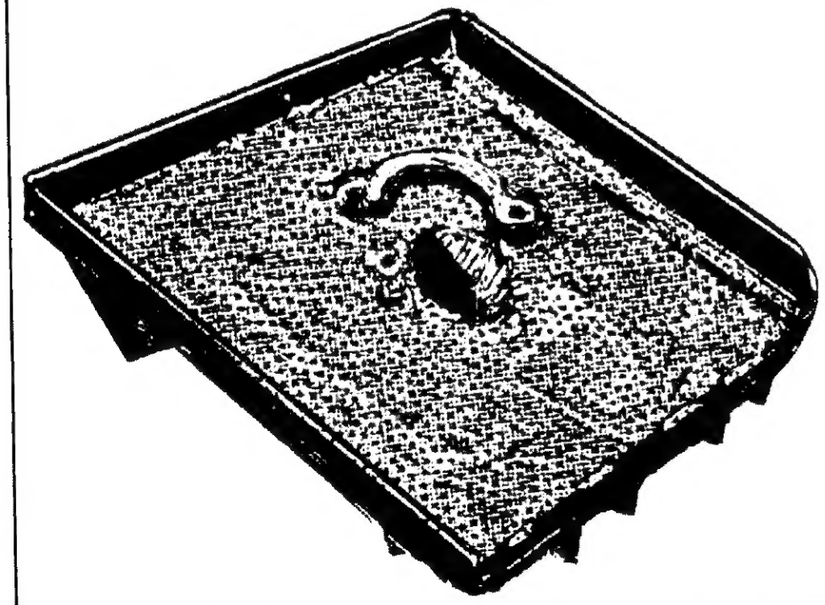
e. Brace (four)- 1.0x6.0x.125 steel sheet.Weld between legs to form a 6.0x6.0 box.Weld to both sets of legs and underside of baseplate.

f. Brace (two)-1.0x3.0x.125 steel. Weld to the two side pieces "e" and to underside of baseplate.

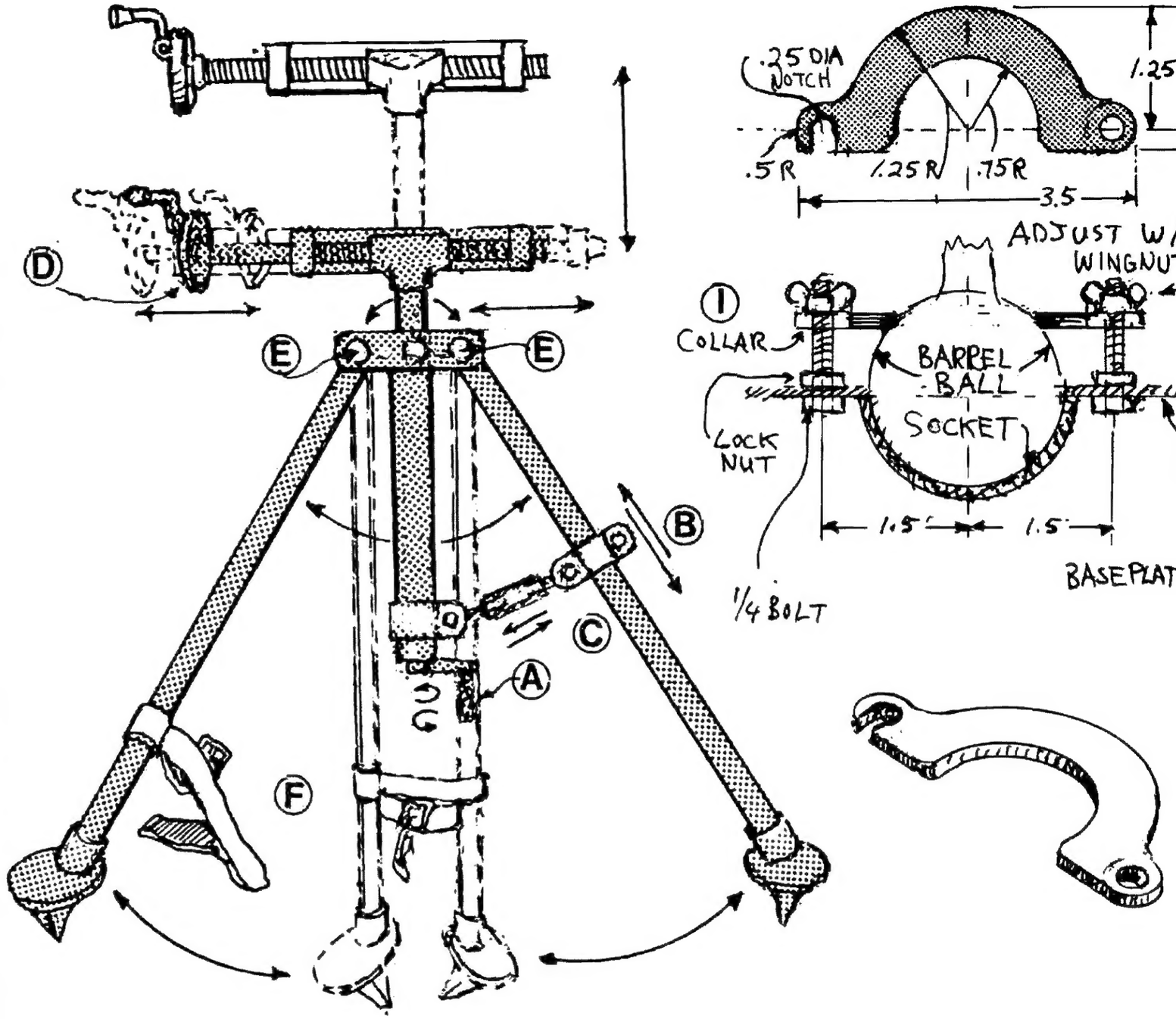
g. Rim/Sides (two)-1.25x.50x10. Weld to top of baseplate.

h. Rim/Rear (one)-1.25x.50x12. Weld to underside of baseplate and to rear edges of g . Round off front edges to .50 r.

i. Front Edge/Small Feet-1.25x.5x12. Make cut-outs to form four feet as shown. Weld completed unit to underside of baseplate.



NOTE: Additional braces may be added if desired. Baseplate may also be produced as a one piece aluminum casting.Make pattern from .1875 to .25 thick styrofoam sheet.(see pg. 120)

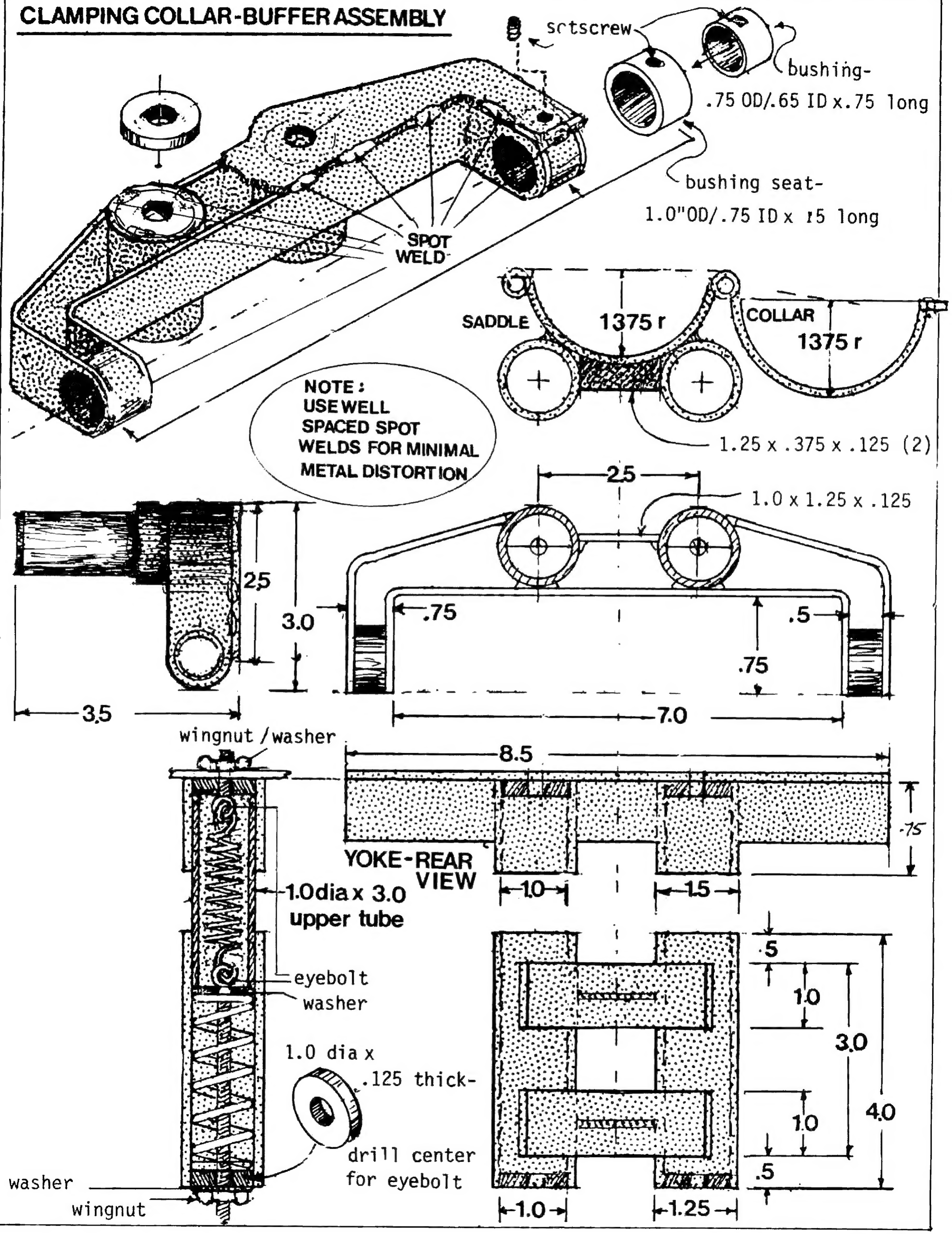


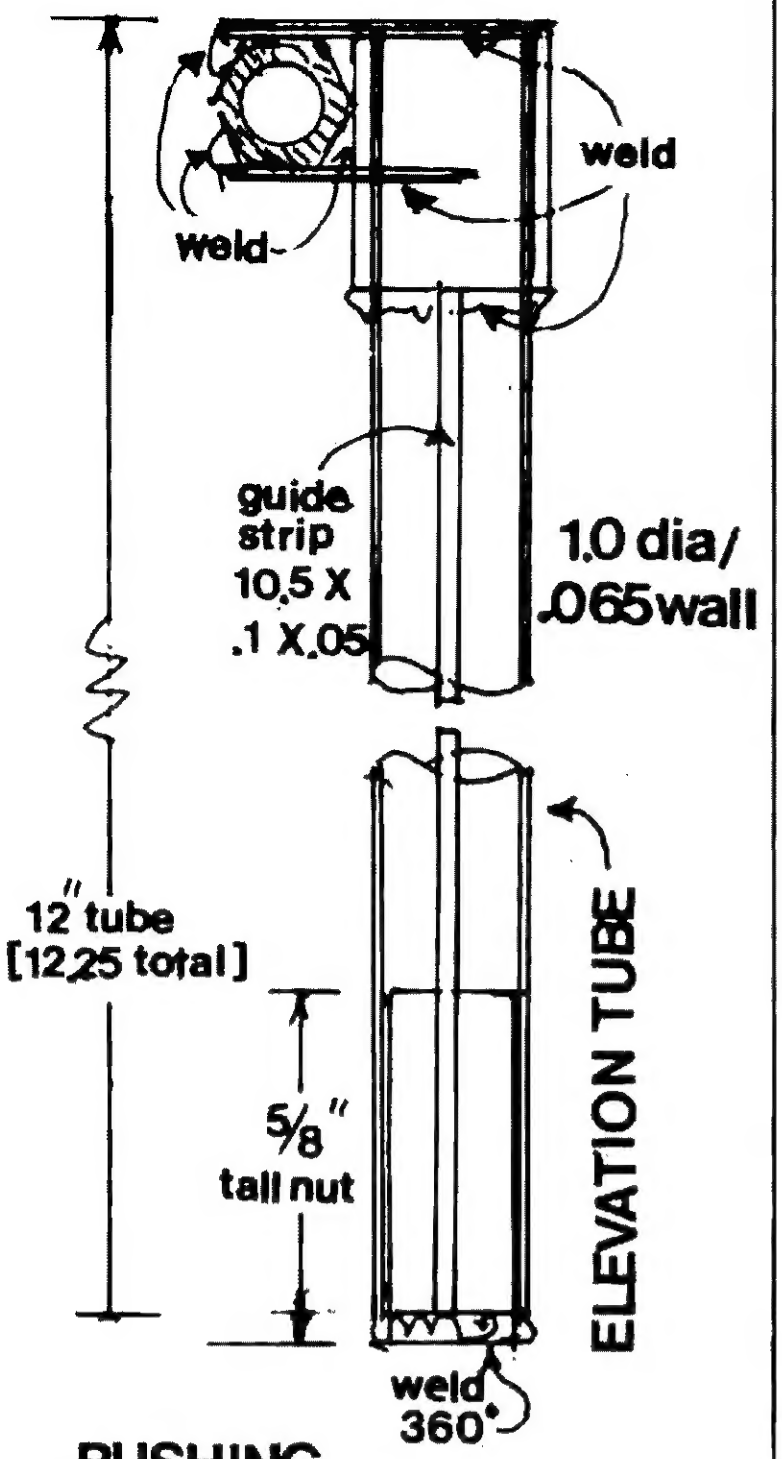
Movement / Adjustment Code

see PMA Vol2 #4
- A. Elevation - Handcrank A
- B. Leveling - (Gross)- Turnbuckle - Leg Clamp B
- C. Leveling (Fine)- Turnbuckle C
- D. Transverse - Handwheel D
- E. Bipod Lock - Pivot Pins E
- F. Bipod Storage - Retaining Strap F

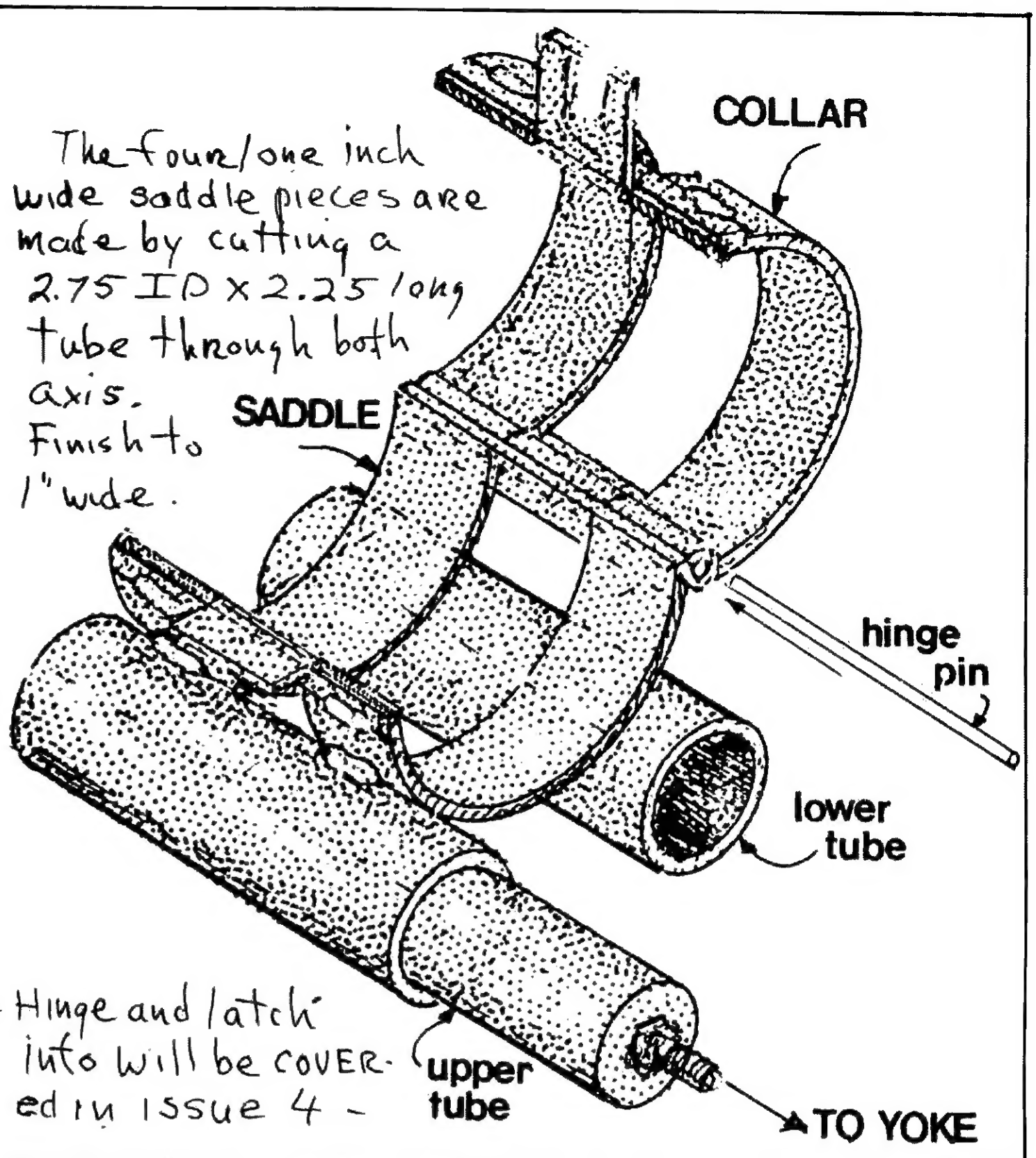
see pages 117-118
- G. Barrel / Bipod Joint - Clamping Collar G
- H. Recoil Absorption - Buffers H
- I. Barrel / Baseplate Joint - Retaining Collar I

CLAMPING COLLAR-BUFFER ASSEMBLY

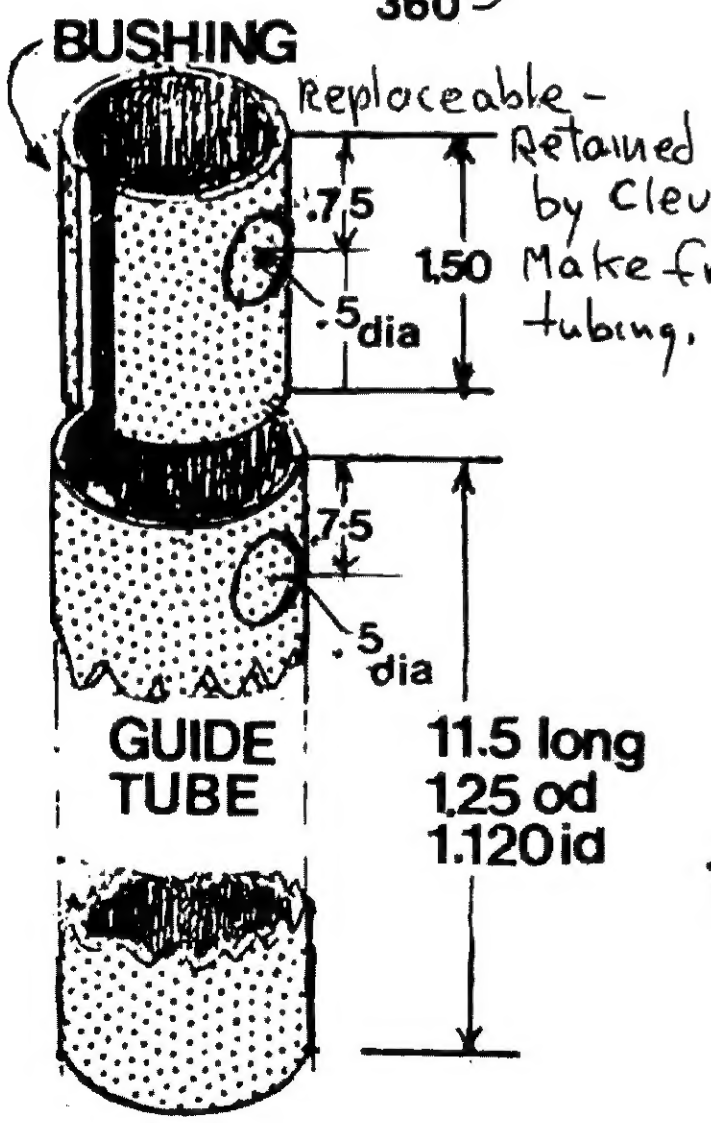




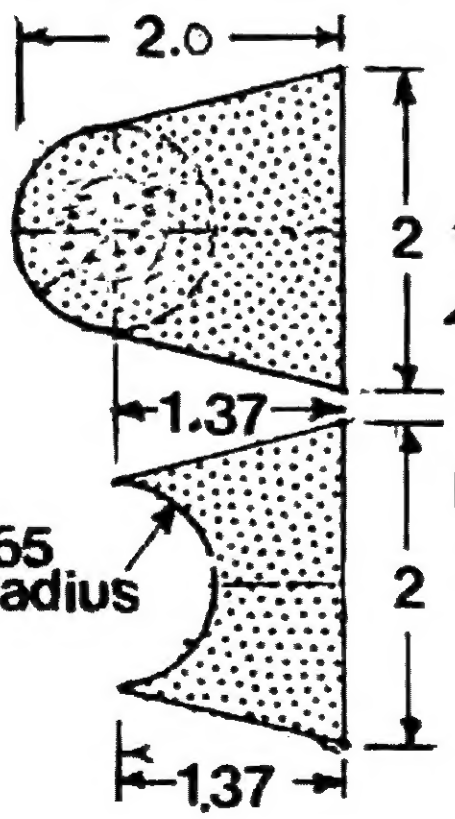
The four/one inch wide saddle pieces are made by cutting a 2.75 ID x 2.25 long tube through both axis. Finish to 1" wide.

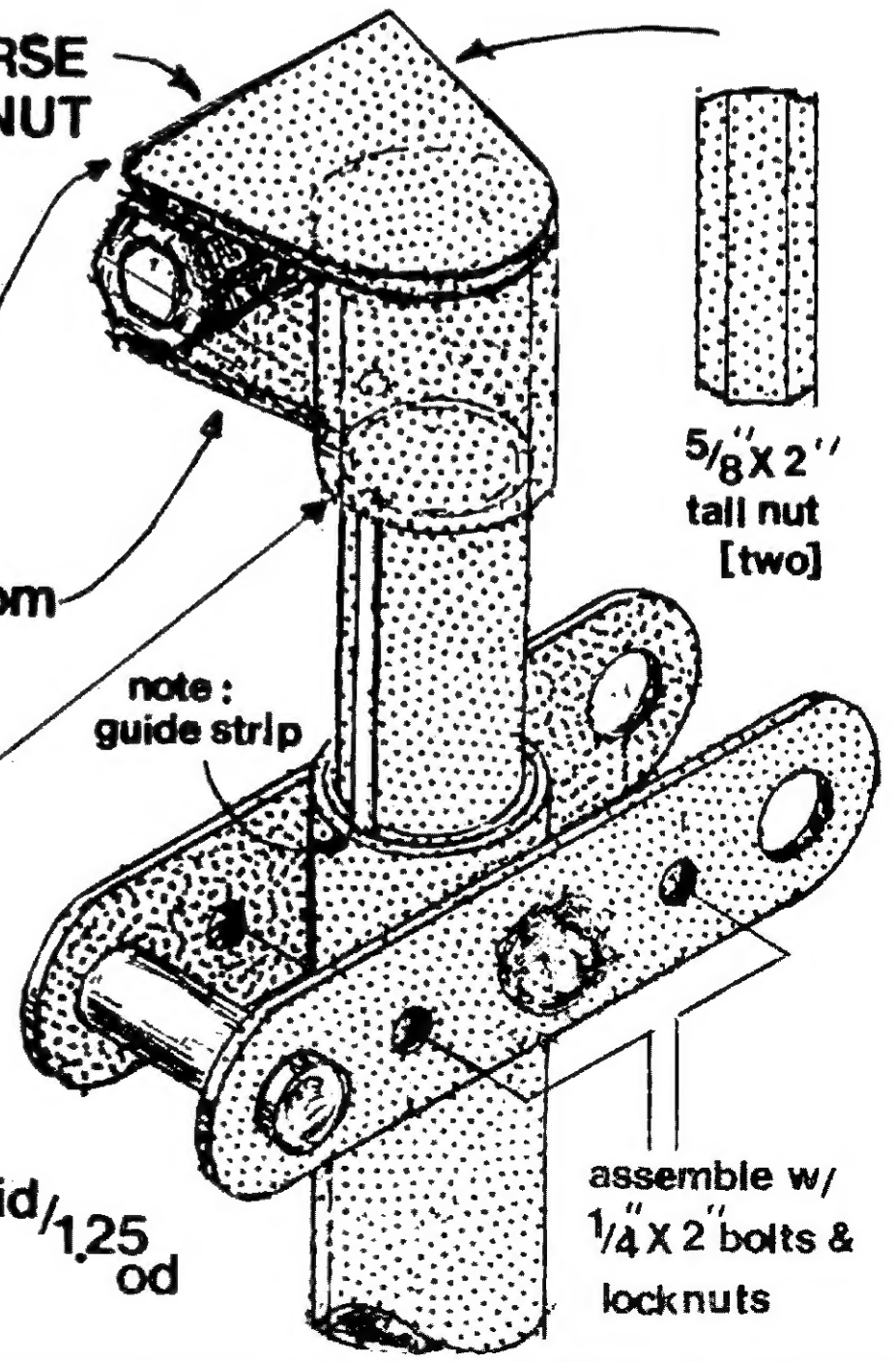


- Hinge and latch info will be covered in issue 4 -



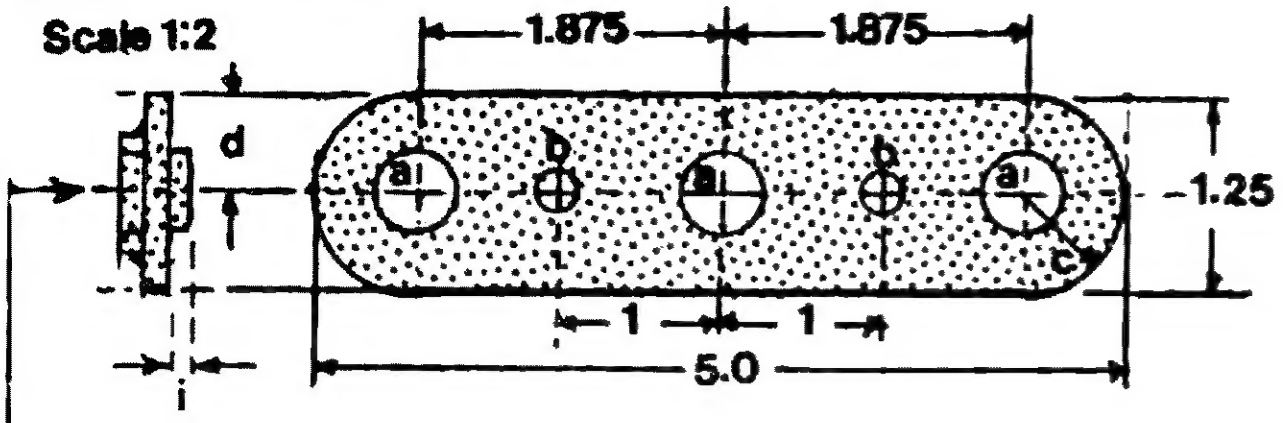
Weld inside guide tube / flush





BIPOD ASSEMBLY

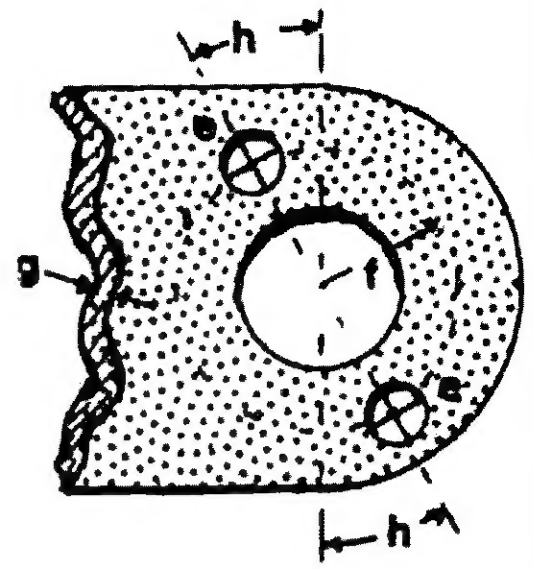
Scale 1:2



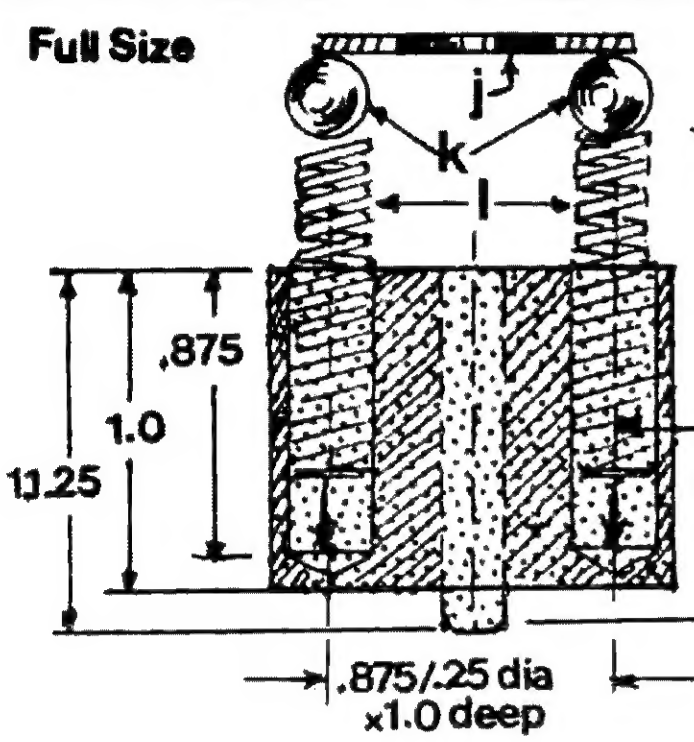
Weld one .245(max.length).5 diameter bolt in center hole of each plate.These act as pivot points for the elevation guide tube.

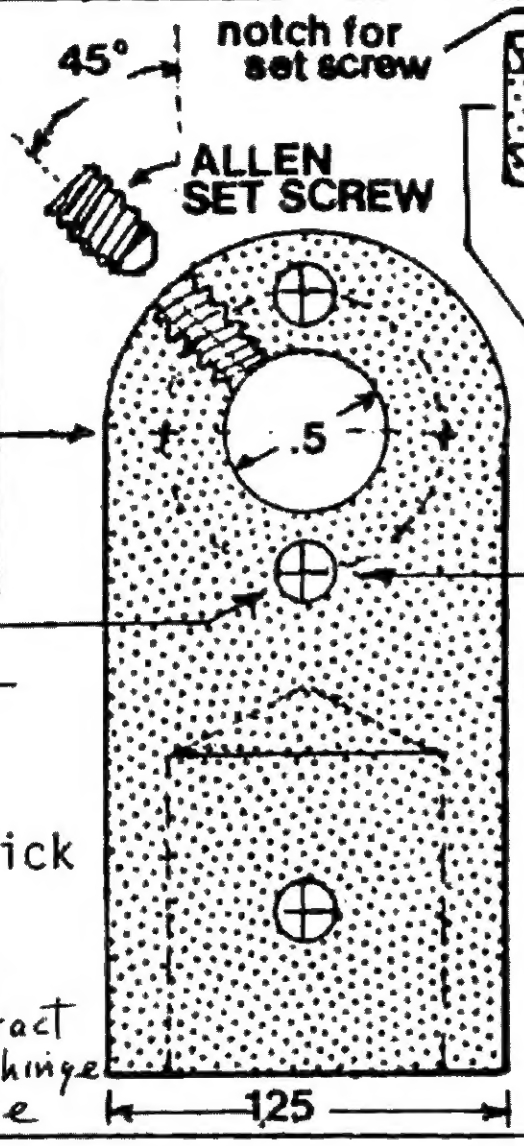
Clevis Plate -Mild Steel-Make2

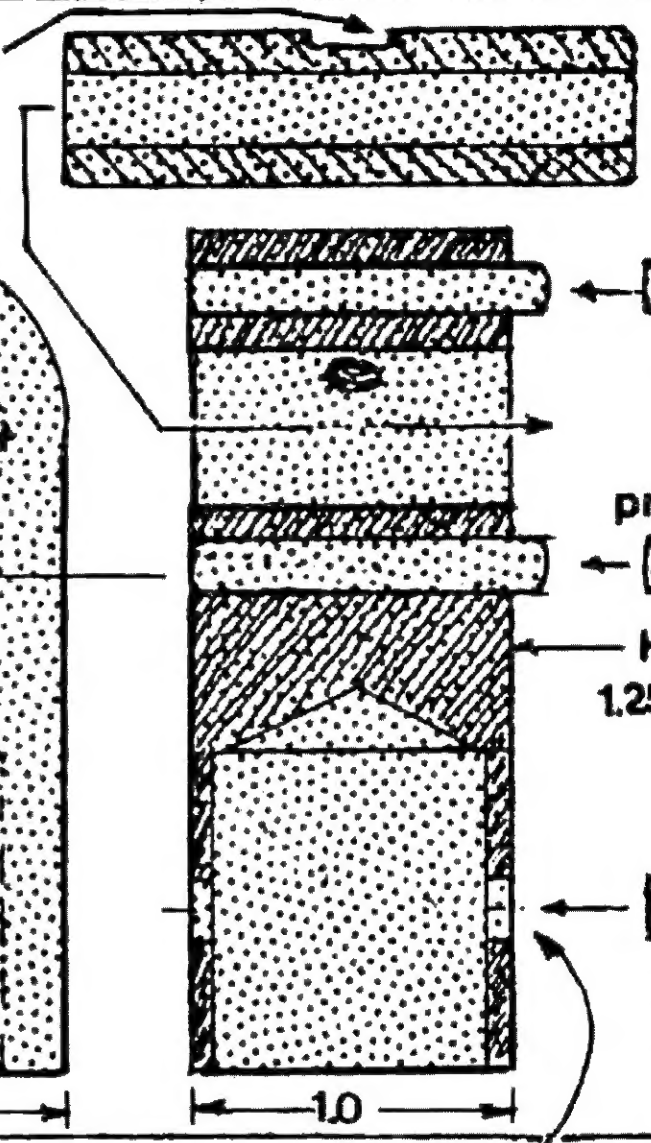
a -.5 dia
b -.25 dia
c -.625 radius
d -.625
e -.1875 dia
f -.875 radius
g -.125 thick
h -30°
I -.120 max



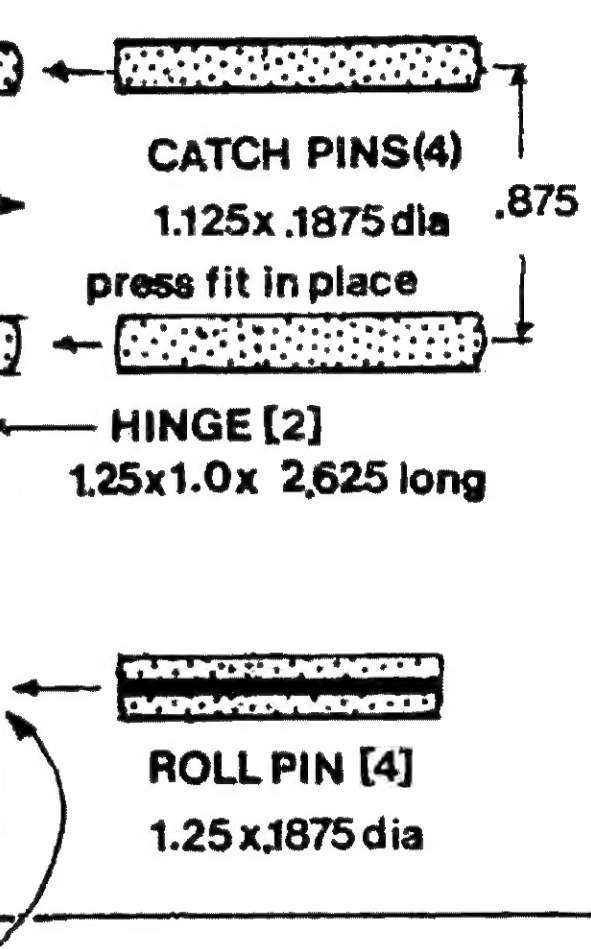
Full Size







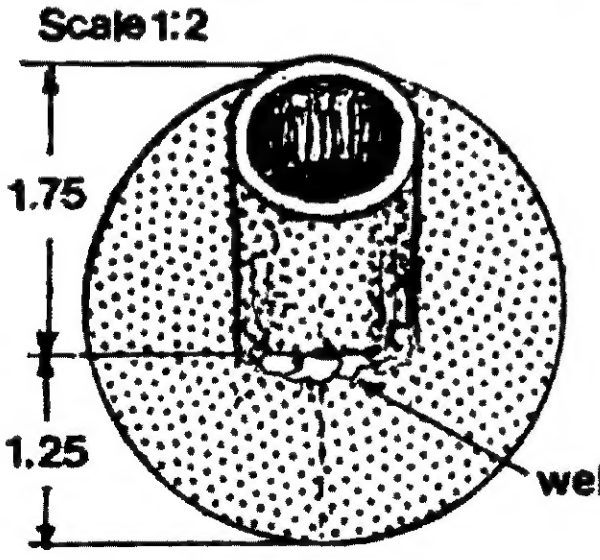
PIVOT PIN(2)
1.75x.5 dia tubing
.125 min. wall



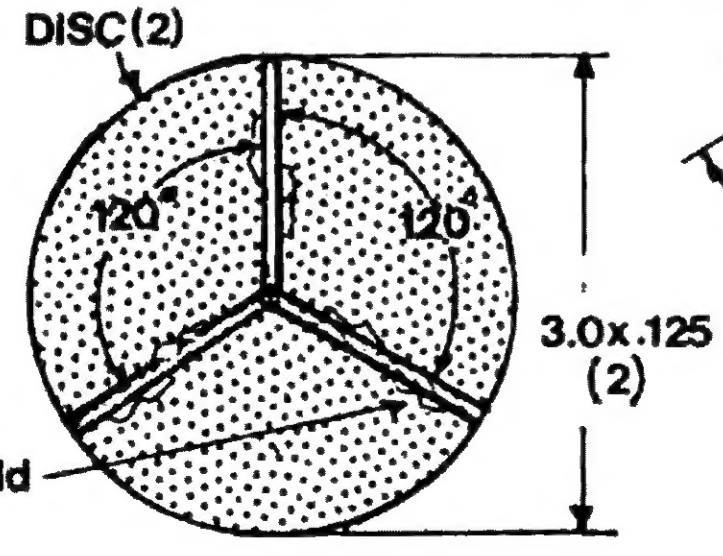
j-WASHER 1.0 OD/.5 ID/.065 Thick
k-BALL BEARINGS (2) .2 Dia
l-SPRINGS (2).2 ODx 1.0 Long

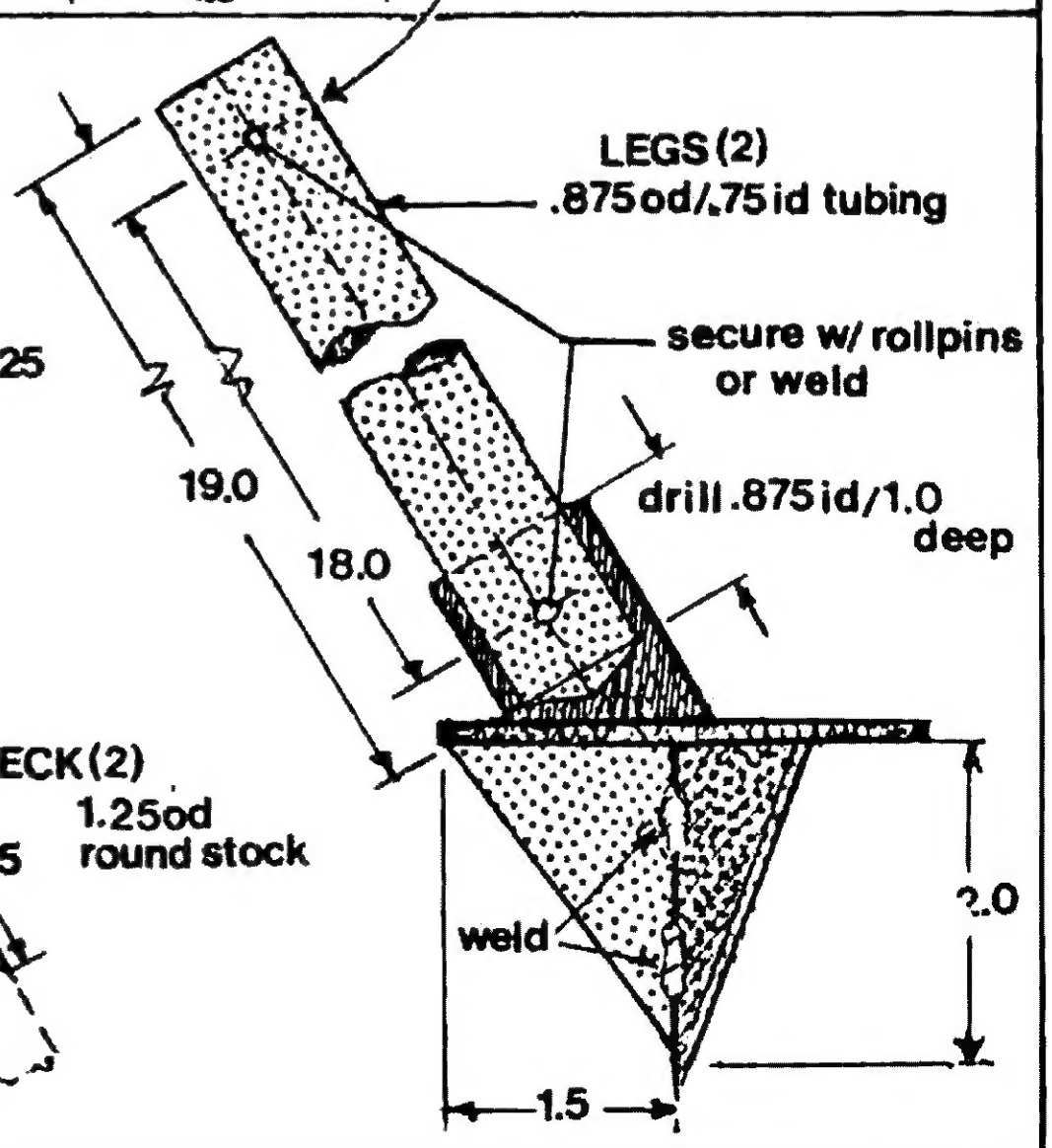
Ed Note: This hinge is an exact copy of the Mini 14 Stock hinge designed by Garth Chvate

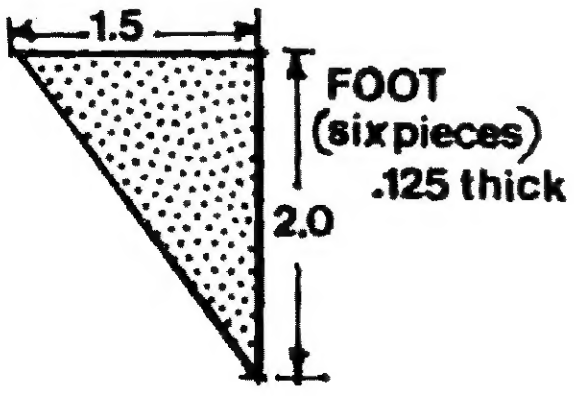
Scale 1:2

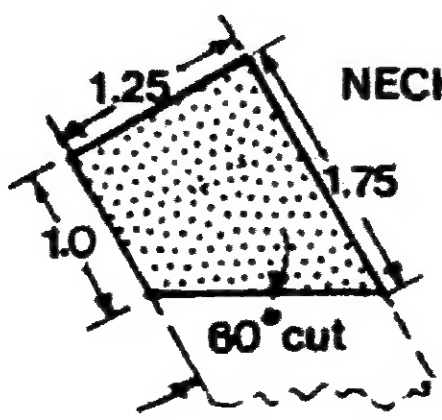


DISC(2)









60mm Mortar
part 5 by Clyde Barrow

I Introduction

This final segment of the 60mm Mortar series will cover the following areas:

Section II Completion of the bipod and collar assemblies.

Section III M-4 Mortar sight.

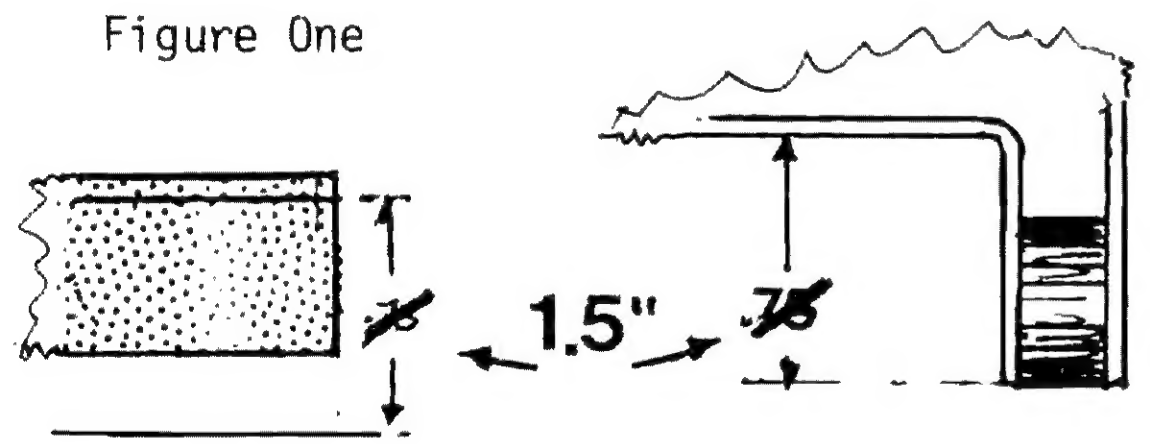
If you intend to build a 60mm Mortar you should obtain a copy of the Army manual which contains complete info on setup, aiming, firing and maintenance.

US Army FM 23-85, 60mm Mortar. $5ppd. Available from: Arm & Merchant Books, 1210 J Street, Modesto, CA 95354.

This firm also carries firing tables, plotting charts and similar data related to the 60mm Mortar. Contact them for more info and prices.

Please note the two corrections marked in Figure One. The area shown is from the right side of the section on building the yoke/ PMA Vol.2 page 117. Ed.

Figure One



II Completion of Bipod and Collar Assemblies.

1.-Saddle Collar Latch (See Fig.2)

a. After hinging the two collar halves as outlined in Issue 3, weld one .75"x1.0" slotted tab to each half of the collar.

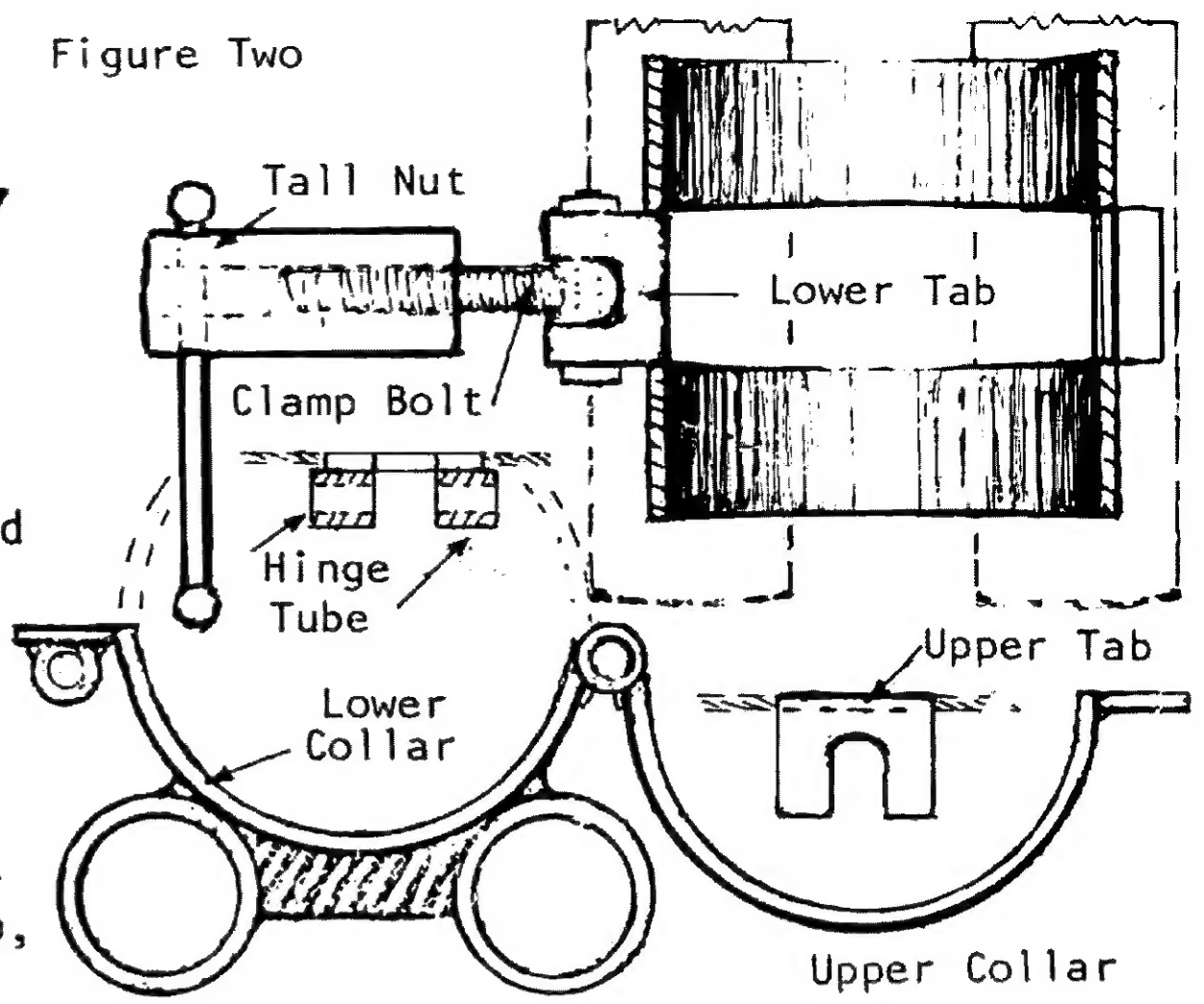
b. Weld two hinge tubes to the bottom edge of the lower tab.

c. Weld a third hinge tube to the bottom of the clamp bolt.

d. Assemble hinged bolt to the lower collar assembly.

e. Construct and install the "tall" nut as shown in Fig. 2.

Figure Two



2.-Elevation Mechanism (Cont. from PMA Vol. 2/ page 118)

-Individual Parts Specs (See Fig.3)

a. Elevation Tube: 1.0"OD - .065 wall X 12" long (see Vol.2 pg.118).

b. Guide Tube: 1.25"OD - .065 wall X 11.5" long (see Vol.2 pg.118).

c. Elevation Screw: 5/8" threaded rod (5/8 NC X 11 TPI) X 12" long. Weld a 5/8" nut in place on the screw with 2" of thread exposed beyond the nut.

d. Thrust Washers (2): .65"ID/1.0"OD. Washers may be fiber or nylon, approximately .1" thick.

e. Elevation Crank: 5/8 NC threads. You may modify an existing crank or build one from scratch as shown in Fig.3. Crank can be secured with a set screw,pin or jam nut.

-Final Assembly (Fig.4)

a. Turn elevation screw into the lower end of the elevation tube.

b. Drop thrust washer into the guide tube. It should come to rest on the top of shoulder welded into the tube's bottom.

c. Align guide strip on elevation tube w/guide slot in the top bushing of the guide tube. Slide elevation tube down into the guide tube until it rests on the thrust washer.

d. Install a **se**cond thrust washer and the elevation crank on the screw protruding from the bottom of the guide tube.

e. Elevation tube should move up and down freely when crank is turned. Be sure to apply grease to all surfaces before assembly.

fig 5-6

3.4"

12" Screw

8.6"

5/8" SHAFT COLLAR

5a

TRANSVERSE NUT

Top View

5d

Front View

5c

Screw Cover

THRUST WASHER

5e

Set Screw Groove

3a

TUBE

.4X.4 Cutout

A

5/8X11 TPI

.8

Side View

Hinge Pin

Drill Pin Hole

Section AA

1.6

1.2

.8

.4

.2

A

Top View

.1875 R

1.1

5b TRANSVERSE HANDLE

Peen Ends

Pin

Welded Nut

2"

3c

12" Screw

Guide Tube Shoulder

Leg Hinge

3b

fig 3-4

Elevation Tube Nut

11.5" GUIDE TUBE

12.25" ELEVATION TUBE

3d

THRUST WASHER

.8

Bottom View

1.8

.4

Side View

3e ELEVATION HANDLE

3.-Transverse Mechanism (See Fig.5)
-Individual Parts Specs

a. Transverse Screw: 5/8" threaded rod (5/8 NC X 11 TPI) X 12" long.

Weld a 5/8" NC nut in place on the screw with 8.6" of thread exposed. File a groove for shaft collar installation. Groove location is determined after test fitting the screw in the yoke assembly.

b. Handwheel: 5/8"NC threads.

Modify an existing handwheel or build one from scratch as shown in Fig.5.(Folding handle is optional).

c. Sleeve: 5/8"ID metal tube.

Cut to length to fit over screw between the yoke and handwheel assemblies. (Non-functional/serves as a thread cover only.)

d. Transverse Screw Retainer:

Use a commercial 5/8"ID shaft collar. Collar is secured in place w/set screw that fits into a groove cut in the transverse screw.

e. Thrust Washer (2): Same as used in Elevation Screw Assembly. (II2d)

-Final Assembly (See Fig.6)

a. Slip one thrust washer over the end of the transverse screw.

b. Insert screw through the bushing in the right leg of the yoke assembly.

c. Slip on a second thrust washer followed by the shaft collar.

d. Turn the screw into the nut on the elevation tube. Continue to turn until the tube is about centered on the screw.

e. Feed the screw into the bushing on the left leg of the yoke assembly. Continue until the outer thrust washer is flush against the outside of the yoke assembly.

f. Slide the collar into position and mark the screw for cutting the groove. When groove is cut, secure the collar in place.

Additional washers may be used to take up any side play in the finished assembly.

g. Install sleeve and handwheel on outside of screw assembly.

h. Transverse nut should move freely on screw when wheel is turned.

4.-Coarse/Fine Leveling Adjustments Fig.7

a. Leg Clamp (Coarse Adjustment).

Construct clamp from a block of aluminum as outlined in Fig.7. Finished clamp should hold firmly when tightened and should slide freely when loosened. Secure clamp to bipod leg w/same screw and "tall" nut shown in Fig.2.

b. Turnbuckle (Fine Adjustment) Fig.8

Use any commercial turnbuckle that measures about 3.5" closed and 5" when extended. Secure one end to the leg clamp and the other to the tabs on the elevation tube.

c. Turnbuckle Mount Tabs Fig.9

Cut two .75" square tabs from 12 gage steel sheet. Drill one mount hole through the center of each tab. The outer edges of the tabs can be ground to a .375" radius if desired. Weld the tabs to the elevation tube with the mount holes about 1.5" from the tube bottom. The space between the tabs should be sufficient to allow insertion of the turnbuckle eye plus two washers.

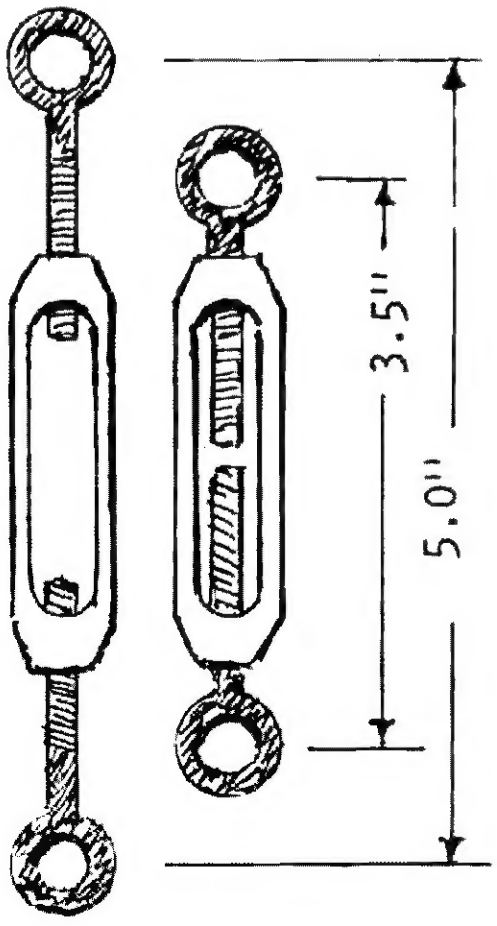
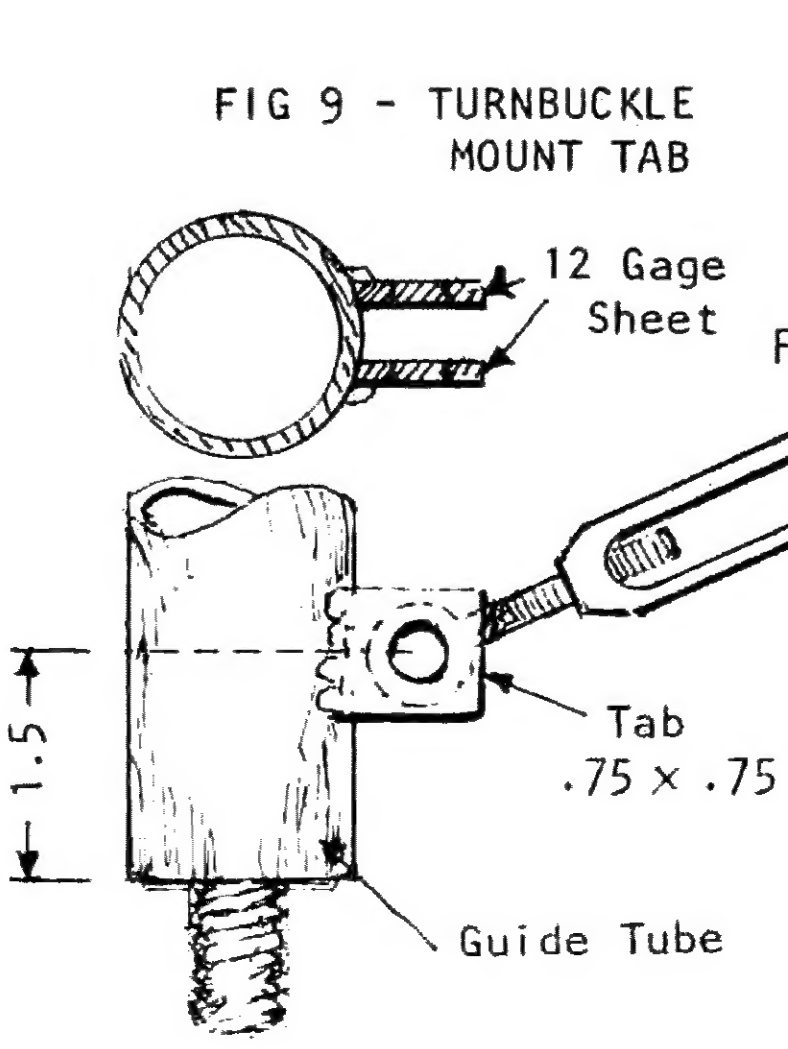


FIG 8 - TURNBUCKLE

FIG 9 - TURNBUCKLE MOUNT TAB



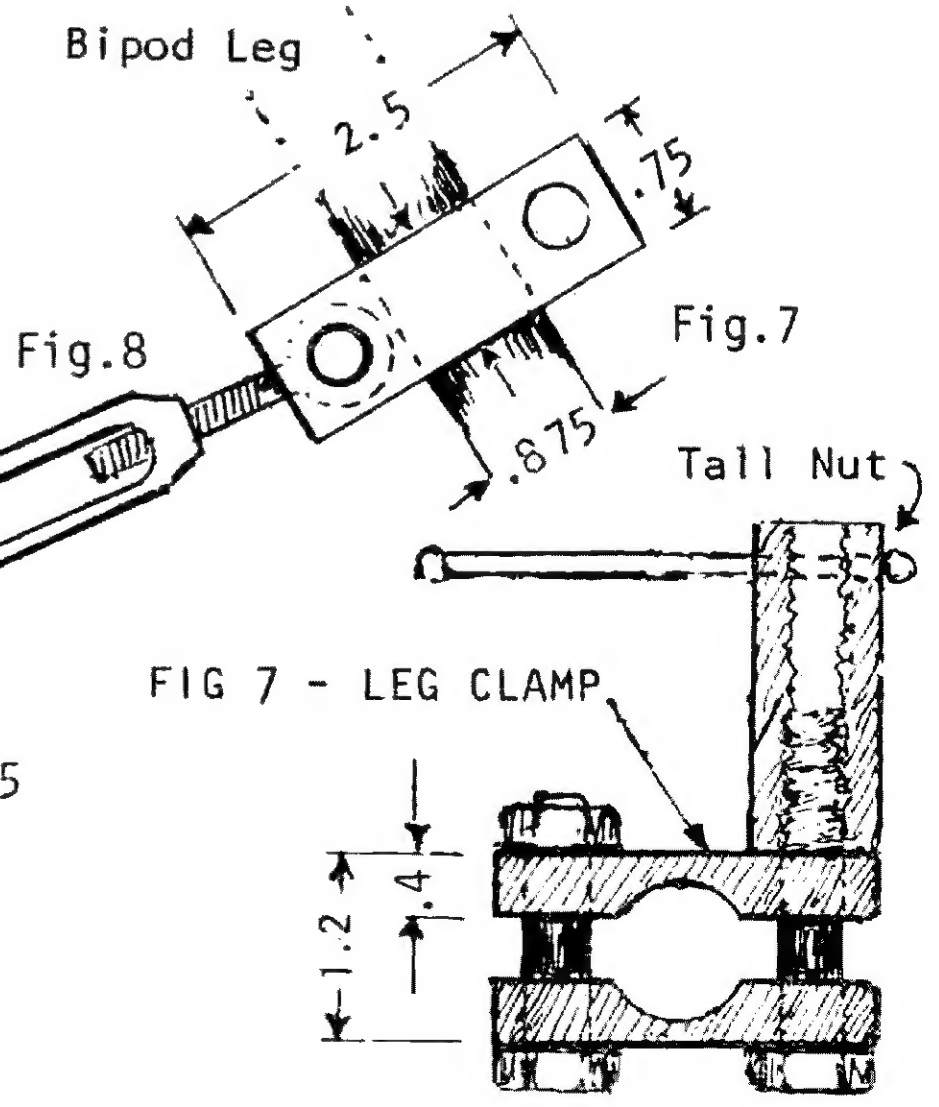


Fig.8

Fig.7

FIG 7 - LEG CLAMP

III The M-4 Mortar Sight Figure 10

The aiming/firing system for the 60mm Mortar is based on the mil. This system, described in detail in the field manual,is too lengthy to cover here except in the most general terms.

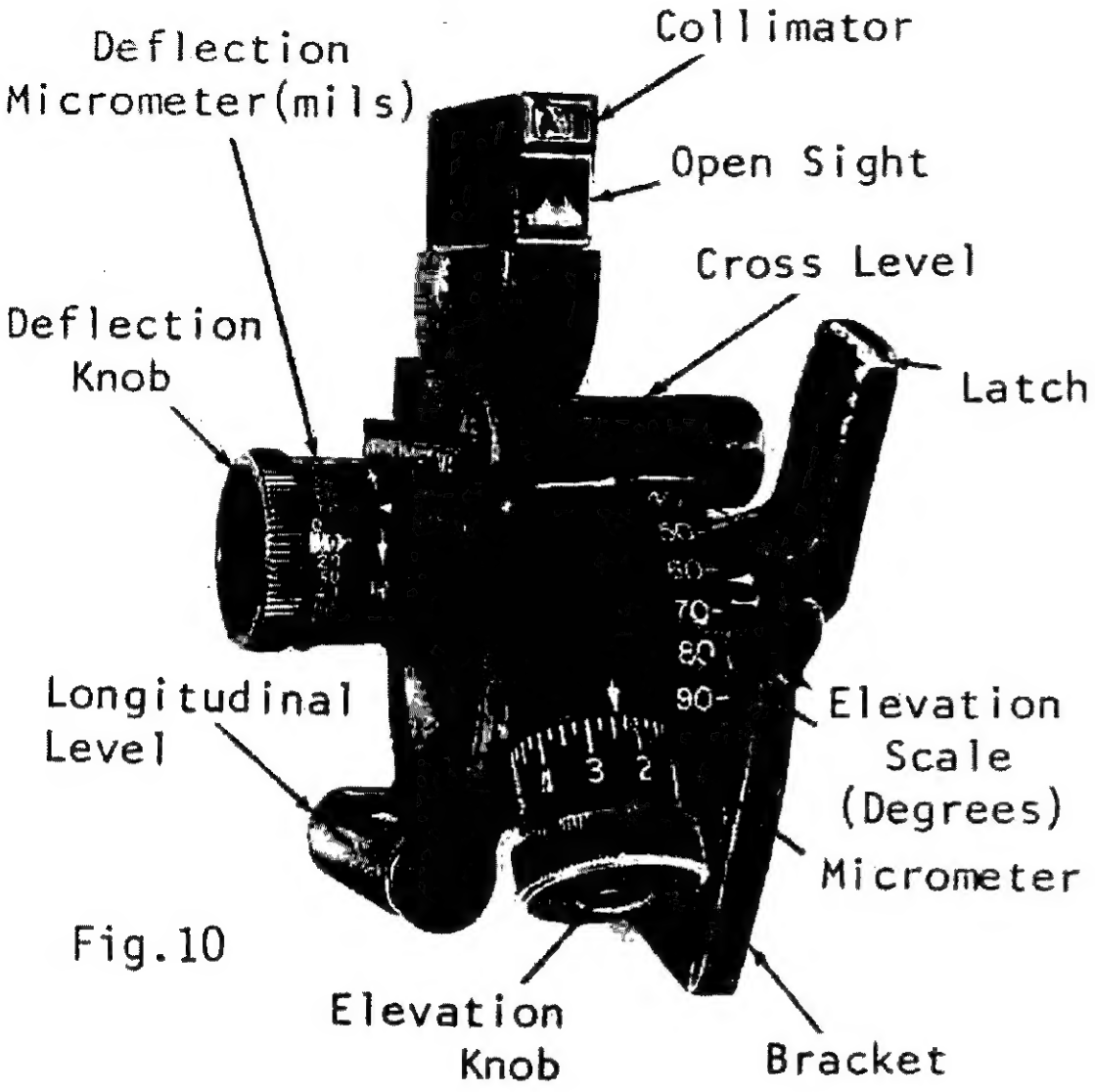


Fig.10

Horizontal sight movement is based on the circle (360°) which is divided into 6400 mils. One degree = approx 17.78 mils. The M-4 sight moves 150 mils (approx 8.4°) both right and left of center. The total horizontal movement or deflection is 300 mils (approx 16.8°). The adjustment dial has click stops at 5 mil intervals. Each click moves the sight approximately.28°.

Vertical movement of the M-4 sight is measured in degrees of elevation. The elevation dial moves the sight .25° per click, 4 clicks = 1°. Elevation adjustment ranges from 40° to 90°.

Two levels are mounted at right angles on the sight base. These aid in leveling the mortar/sight assembly when aiming.

The M-4 sight fits into a dovetail mount on the left leg of the yoke assembly.

The viewer on top of the sight may be moved up and down by hand to bring it in line with target.

You may be able to find a usable M-4 sight at a gunshow or surplus store for about $15. Several mailorder science supply houses used to carry the M-4 sight in the early 1970's, but they are apparently no longer available.

Vehicle Armor (Cont.from pp.132)

IV - Recently Developed Armor Materials

B - Flexible (Soft) Armor

DuPont Kevlar yardage can be used in a variety of vehicle armor applications.

1. Stationary Pads

These are used under door panels,seat backs, headliners and carpeting.The pads are considered permanent and are removed only for maintenance.

Construction of armor pads is fully outlined in section on Body Armor.

2. Body Cavity Filler

Kevlar remanents can be stuffed into odd shaped body recesses such as window/ windshield pillars, front/rear quarter panels and under the dashboard. These pieces should be packed into the space as tightly as possible and held securely in place.Care should be taken to insure that the armor filler doesn't interfere with any mechanical functions of the vehicle.

3. Removable Pads

If the vehicle needs to be armored only at certain times,or if additional protection is needed for a vehicle that is lightly armored,removable armor pads can be used.These allow for quick installation and removal,as well as eliminating the need to remove the upholstery and carpet for installation.

Armor pads can be designed to hang over the inside of car doors,drape over seat backs or even hang from the tops of door frames to serve as removable window curtains.Pads should be enclosed in canvas or cotton duck covers to add stability and prevent dirt and abrasion damage.

To simplify armor placement, grommets or quarter-turn fasteners (female half) may be installed around the perimeter of the cover.

A large blanket type armor pad can be folded and kept in the vehicle. This may be wrapped around the target's body when protection is needed, both in the vehicle and when moving from the car to a building.